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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Salem District Office

1717 Fabry Road

Salem, Oregon 97306

5410 (085)

Gotaway Thinning Timber Sale

Tract No. 01-301

EA No. OR080-00-08

The Bureau of Land Management, Marys Peak Resource Area, invites you to review the attached Gotaway Thinning Timber Sale Environmental Assessment and Finding of No Significant Impact. This document describes the issues and analyzes the probable impacts to resources from the proposed project.

The proposed project is located in Township 14 South, Range 6 West, Section 3 1, Township 14 South, Range 7 West, Sections 25, 26 and 35, Township 15 South, Range 6 West, Section 6, W.M. in the South Fork Alsea River Watershed. Density management harvest would occur on approximately 152 acres and commercial thinning harvest on 67 acres using ground-based yarding systems. Hardwood conversion would occur on approximately 9 acres conifer release would occur on approximately 1 acre. Road renovation and closure following harvest operations of approximately 4,500 feet of existing road are also proposed. The proposed actions are designed to attain Aquatic Conservation Strategy objectives.

We are interested in hearing from you, and ask that you provide us with your comments by July 5, 2001. Comments specific to the alternatives would be the most helpful.

If you have questions about the environmental assessment, please call Gary Humbard at (503) 315-5981. Please send your written comments to Field Manager, Marys Peak Resource Area, Salem District, Bureau of Land Management, 1717 Fabry Road S.E., Salem, Oregon, 97306.

Sincerely,

Acting Field Manager

Marys Peak Resource Area

* Note - Comments, including names and addresses of respondents, will be available for public review at the same time as the EA during regular business hours (7:30 a.m. to 4:00 p.m.), Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations of businesses, will be made available for inspection in their entirety.

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SALEM DISTRICT OFFICE
MARYS PEAK RESOURCE AREA**

**ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT
IMPACT FOR
GOTAWAY THINNING TIMBER SALE**

EA NUMBER : OR-080-00-08

Date: May 29,2001

PREPARED BY: Interdisciplinary Team; Gary Humbard, Team Lead

AREA ENVIRONMENTAL COORDINATOR: Belle Smith

Summary: This document is an Environmental Assessment and Finding of No Significant Impact for the proposed Gotaway Thinning Timber Sale, tract number 01-301. The project area is located in Township 14 South, Range 6 West, Section 31, Township 14 South, Range 7 West, Sections 25, 26 and 35, Township 15 South, Range 6 West, Section 6, Willamette Meridian, Benton County. The land use allocations are Matrix (General Forest Management Area [GFMA]), Late Successional Reserve and Riparian Reserve.

Alternative 1, the proposed action, would involve density management and commercial thinning harvest of 35-50 year-old Douglas-fir forest and hardwood conversion and conifer release areas in red alder dominated stands. Approximately 2,300 thousand board feet of trees would be removed from approximately 229 acres. This action would harvest timber using ground-based yarding system (harvester/forwarder or conventional crawler tractor) and renovation and closing of existing roads.

Alternative 2 is the No Action alternative in which density management, commercial thinning, hardwood conversion, conifer release and renovation and closing of existing roads would not occur.

The environmental analysis focuses on the following issues identified through scoping and by an interdisciplinary team of BLM resource specialists:

Vegetation: Effects on native vegetation and special status/SEIS special attention species and habitats and noxious weeds.

Soils/Fuels: Effects on long-term site productivity as related to soil compaction. Effects on fuel loading and fire risk.

Water/Riparian: Effects on stream flow, channel conditions, water quality and aquatic conservation strategy objectives.

Wildlife: Effects on special status, special attention and other wildlife species and their habitats.

Fisheries: Effects on fisheries and their habitats.

Visual: Effects on VRM II designated lands.

For further information, contact Gary Humbard (503-315-5981), 1717 Fabry Rd. S.E., Salem, Oregon, 97306. Comments on this environmental assessment are due July 5, 2001.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM), Marys Peak Resource Area has analyzed the potential effects of a timber harvest project in the upper drainage (T. 14 S., R. 7 W., Secs. 25, 26, 35 and 36; T. 14 S., R. 6 W., Sec. 31, T. 15 S., R. 6 W., Sec. 6 W.M.) of the South Fork Alsea River Watershed, Marys Peak Resource Area, Benton County, Oregon. The action described in this environmental assessment (EA) is proposed to conduct a density management harvest to manage habitat conditions for understory development which enhances structural diversity; create coarse woody debris now lacking in the riparian reserve and late successional reserve areas; and increase diameter growth for achieving future potential coarse woody debris sources more quickly than under current growth conditions; commercial thinning to meet the annual allowable sale quantity for the Resource Area, conifer release and hardwood conversion to promote and develop a diversity of species and create future coarse wood debris within convertible hardwood dominated stands. The action would meet the needs for forest products and forest habitat as identified in the *Salem District Record of Decision and Resource Management Plan* (the RMP; see pp. 1 and 2). The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

This FONSI and the EA are being made available for public review prior to making a decision on the action. The public notice of availability for review will be published in local newspapers of general circulation and through notification of interested individuals, organizations, and state and federal agencies. They will also be available for review on the internet at this address: <http://www.or.blm.gov/salem/planning>.

Finding Rationale

For the alternatives analyzed, significant impacts on the quality of the human environment would not occur based on the following criteria:

1) The alternatives are in conformance with the following documents which describe the objectives, land use allocations, and management actions/direction for BLM-administered lands in the Marys Peak Resource Area:

- *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001)

- *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

- *Salem District Record of Decision and Resource Management Plan* (RMP, May, 1995).

- *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS, September., 1994).*

- *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, April 1994) and the Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional Forest Related Species Within the Range of the Northern Spotted Owl (SEIS, February 1994).*

- *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement (VMFEIS, February 1989) and the Western Oregon Program-Management of Competing Vegetation Record of Decision (August 1992).* The VMFEIS analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33).

2) The alternatives are consistent with other federal agency and State of Oregon land use plans and with the Benton County land use plan and zoning ordinances. Any permits associated with the implementation of this project would be obtained, and all requirements would be met.

3) No floodplains, wild and scenic rivers, prime or unique farmlands occur within the proposed harvest areas.

4) No known cultural or paleontological resources occur in the project area. A post-harvest survey would be done upon completion of the project according to *Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon*; Appendix D dated August 5, 1998. .

5) No hazardous materials were observed in the project area nor would they be created by the proposed action. Any chemicals or fuel used on the site would be handled using best management practices (RMP Appendix C).

6) Conformance of the alternatives with the Aquatic Conservation Strategy (ACS) components listed in the RMP (pp. 5 and 6) are displayed in the following table:

RELATIONSHIP OF ALTERNATIVES TO RELEVANT MANAGEMENT DIRECTION

Management Direction	Relationship of This Action
Interim Riparian Reserves	Alt. 1 (Proposed Action): Density management harvest would occur inside Riparian Reserves. Management actions/direction for Riparian Reserve include application of silvicultural practices to control stocking, etc. (RMP p.11) Alt. 2: Riparian Reserves would remain undisturbed.
Key Watersheds	The proposed project area is not in a Key Watershed.
Watershed Analysis	The first iteration of the <i>South Fork Alsea Subwatershed Analysis</i> was completed October 1995. The analysis found that coarse woody debris was lacking in Riparian Reserves (pp. 39-46). The <i>South Fork Watershed Analyses Riparian Reserve Treatment Recommendation Update</i> (May 2000) recommended density management for stands lacking vertical structural diversity (p. 8).
Watershed Restoration	Restoration of the condition of riparian vegetation is one of the most important components of watershed restoration to aid recovery of aquatic ecosystems. (RMP p. 7)

7) The sale area does not qualify for potential wilderness nor has it been nominated as an area of critical environmental concern.

8) Project design features would assure that potential impacts to water quality from this project would be in compliance with the State of Oregon's In-stream Water Quality Standards and thus the Clean Water Act.

9) In accordance with the RMP (see pp. 21-22), the amount of late-successional forest (i.e., 80 years and older) on federal lands was determined for the Upper Alsea Watershed. The 80+ forest age classes occur on approximately 32 percent of the federal lands in the Upper Alsea. This exceeds the RMP standard of 15 percent. Approximately 48 acres of late-successional forest stands would be affected by this action.

10) The proposed action is within the coastal zone as defined by the Oregon Coastal Management Program. This proposal is consistent with the objectives of the program and the state planning goals which form the foundation for compliance with the requirements of the Coastal Zone Act. Management actions/direction found in the RMP were determined to be consistent with the Oregon Coastal Management Program.

11) Burning would be accomplished in accordance with the Oregon state implementation plan and the *Oregon Smoke Management Plan* and thus the *Clean Air Act*.

12) To comply with Section 7 of the Endangered Species Act (ESA), the Gotaway commercial thinning and density management project was submitted for consultation with

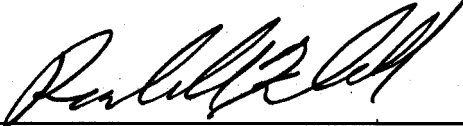
the USFWS as part of the *Programmatic Biological Assessment of Fiscal Year 2001 projects in the Oregon Coast Province which might modify the habitats of bald eagles, northern spotted owls, or marbled murrelets*. This consultation was concluded with the USFWS issuing a Biological Opinion (BO; tracking number 1-7-00-F-649, August 4, 2000). The BO determined that the level of any anticipated incidental take is not likely to result in jeopardy to the bald eagle, northern spotted owl, or marbled murrelet. All applicable Terms and Conditions of this BO have been incorporated as design features of this proposed project.

13) Consultation with the National Marine Fisheries Service (NMFS) has been completed. The Biological Assessment, which assessed potential impacts to listed fish in the Oregon Coast Evolutionary Significant Unit (ESU), was submitted to NMFS in March 2001. The Letter of Concurrence dated April 17, 2001, responding to that BA, concluded the proposed project is not likely to adversely affect Oregon Coast coho salmon and steelhead. Any decision on the proposed Gotaway Timber Sale Project would be in compliance with the Letter of Concurrence.

The proposed action is local in nature, and potential adverse impacts would be short-term. Impacts were determined based on observation, and professional training and experience of the interdisciplinary team of BLM natural resource specialists. Determining such environmental effects reduces the uncertainties to a level which does not involve unique risks. The design features identified in the EA would assure that no significant site-specific or cumulative impacts would occur to the human environment other than those already addressed in the EIS.

Finding of No Significant Impact Determination

Based on the analysis of information in the attached EA, my determination is that a new EIS or supplement to the existing EIS are unnecessary and will not be prepared. The proposed action would not result in significant environmental impacts affecting the quality of the human environment greater than those addressed in the existing EIS.



Marys Peak Field Manager

05/30/01

Date

Comments regarding this environmental assessment should be received by the Bureau of Land Management, Marys Peak Resource Area, by July 5, 2001.

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ENVIRONMENTAL ASSESSMENT

I. PURPOSE AND NEED

A. Introduction

The Marys Peak Resource Area of the Bureau of Land Management (BLM) is proposing a commercial thin, density management, hardwood conversion, conifer release harvest and road renovations/closures in Township 14 South, Range 6 West, Section 31, Township 14 South, Range 7 West, Sections 25, 26, 35 and 36, and Township 15 South, Range 6 West, Section 6 Willamette Meridian, Benton County, Oregon. The proposed project area is located approximately seven air miles southwest of Alpine, Oregon.

The proposed action, described and analyzed herein, is intended to meet the needs for forest products and forest habitat as directed by the *Salem District Record of Decision and Resource Management Plan* (hereafter referred to as the *RMP*; see pp. 1 and 2). All applicable direction in the *Northwest Forest Plan* is incorporated in the *RMP*.

This environmental assessment (EA) is tiered to the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000). The S&M ROD amends a portion of the Northwest Forest Plan by adopting new standards and guidelines for Survey and Manage, Protection Buffers and other mitigating measures.

This environmental assessment (EA) is also tiered to the *Salem District Record of Decision and Resource Management Plan* (*RMP*, May, 1995) and the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement* (*PRMP/FEIS*, Sept., 1994). The *FEIS* analyzed broad scope issues and impacts within the President's direction to meet the need for forest habitat and forest products (p. 1). The *RMP* provides a comprehensive ecosystem management strategy for BLM managed lands in the Salem District in strict conformance with the Northwest Forest Plan and the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (*ROD*, April 1994).

The *RMP* was signed by the Oregon/Washington State Director of the Bureau of Land Management (BLM) on May 12, 1995. It is based on a comprehensive ecosystem management strategy for federal lands consisting of management objectives, land use allocations, and management actions/direction. Under the *RMP*, Riparian Reserves are one of the key components in the Aquatic Conservation Strategy and they play a major role in directing management of late-successional forest conditions and biological diversity associated with native species and ecosystems (pp. 5&6). Late-Successional Reserves will be managed to enhance and/or maintain late-successional forest conditions.

This environmental assessment is also tiered to the *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement* (*VMFEIS*, February 1989)

and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992). The VMFEIS analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33). This EA will analyze vegetation management treatments such as release treatments promoting survival and growth of desired vegetation.

Objectives of the proposed commercial thinning within the matrix are to maximize the growth of residual stands, provide a supply of timber, and maintain some stand structural diversity (down woody material, snags, minor tree species). The sale of timber from the proposed action would contribute to local economies.

Approximately 106 acres of the proposed project is classified as Riparian Reserves under the *ROD*. Riparian Reserves are the portions of the watershed required for maintaining hydrologic, geomorphic, and ecological processes that directly affect streams, stream processes, and fish habitats. They are also designed to provide travel corridors and resources for both riparian dependant and other riparian and/or late-successional associated plants and animals.

Both the *ROD* and the *RMP* support thinning young to mid-age Riparian Reserve stands to increase individual tree size. The *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, (April 1994) says “Active silvicultural programs will be necessary to restore large conifers in Riparian Reserves. Appropriate practices may include...thinning densely-stocked young stands to encourage development of large conifers...” (p. B-31) The *RMP* directs us to “Apply silvicultural treatments to restore large conifers in Riparian Reserves” (p. 7) and “Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives” (p. 11).

Approximately 48 acres of the proposed project is classified as Late Successional Reserve (LSR). Late Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems. Commercial thinning is allowed if needed to create and maintain late-successional forest conditions (*ROD*, p. 15). Most of the federal lands designated as Late-Successional Reserves within the northern Oregon Coast Range consist of forest stands less than 80 years of age, and thus are not considered late-successional forest. Silvicultural treatments in managed stands less than 80 years of age offer the opportunity to reduce overstocked density, alter tree species diversity, alter forest structural characteristics, and amend coarse woody debris conditions. Such treatments are believed to result in forest stands that more closely approximate the structure and function of a late-successional forest. Thus, for a majority of forest stands within LSRs of the Oregon Coast Range, silvicultural treatments such as density management and coarse woody debris enhancement are viewed as a means to enhance late-successional forest conditions and accelerate attainment of these conditions across the landscape.

The *Late Successional Reserve Assessment, Oregon Coast Province - Southern Portion* (LSRA, RO267, RO 268, June, 1997) provides guidance for determining which forest stand conditions would warrant silvicultural treatment and what types of treatments would be

appropriate to achieve desired forest stand conditions. The treatment proposed for the LSR portions of the proposed project have been designed to be consistent with the guidance outlined in the *LSRA*.

The proposed project is located in the South Fork Alsea fifth field watershed. The BLM portion of this watershed was analyzed in the *South Fork Alsea Watershed Analysis*, (*SFAWA*, November, 1995) which identifies the proposed project area as a potential treatment area (pp. 79 & 80 and Map 15 & 16), and the *North Fork Alsea and South Fork Alsea Watershed Analyses Riparian Reserve Treatment Recommendations Update* (*RRTRU* May, 2000), which recommends density management after site specific analysis on stands exhibiting characteristics similar to those in the proposed project area (pp. 5&6 and Table 2, p.7). The watershed lacks large woody debris potential for streams (*SFAWA*, p.65) and lacks snags, down wood, sub-canopy layers and species diversity (*SFAWA*, p. 40)

The Gotaway Interdisciplinary Team (IDT) concluded management activities in the Riparian Reserves and Late-Successional Reserve should be used to promote older forest characteristics and attain ACS objectives. Desired riparian characteristics include the following: diverse vegetation appropriate to the water table, geomorphic land type, and stream channel type; diverse age classes/multi-layered canopy; mature conifers where they have occurred in the past; large dead standing/down wood; stream connected to its flood plain (flood plain inundated every 1-3 years) and stream bank vegetation with adequate root strength to maintain bank stability. It is appropriate to use the guidelines found in the *Late Successional Reserve Assessment* (*LSRA*, June 1997) as well as the recommendations of Resource Area biologists to design management activities in Riparian Reserves and Late Successional Reserves which provide for down wood and snags in all decay classes over the life of the stand. The primary concern would be leaving sufficient wood in decay classes one and two. The density management of approximately 152 acres would be implemented to meet all of these goals.

This environmental assessment is also tiered to the *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement* (*VMFEIS*, February 1989) and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992). The *VMFEIS* analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33).

This EA is a site-specific analysis of the proposed action and alternatives prepared under general management guidance provided in the *RMP*. The *RMP* is available for review in the Salem District Office. A general description of the project area may be found in this EA under Description of Affected Environment/Environmental Consequences. Additional information about the proposed project is available in the Gotaway Project EA file.

B. Scoping

Efforts to involve the public in decisions leading up to this proposed action were as follows:

- The general area was shown as Matrix (GFMA), Riparian Reserve and Late Successional Reserve in the Northwest Forest Plan and the *RMP*. These documents

were widely circulated in the state of Oregon and elsewhere, and public review and comment were requested at each step of the planning process.

- A letter was mailed to interested parties as shown on the Gotaway mailing list on October 11, 2000 requesting initial public input.
- A description of the proposal was included in the Salem Bureau of Land Management *Project Update* and mailed in September and December of 2000 and March 2001 to more than 900 individuals and organizations on the mailing list.
- A news release announcing availability of the EA for public review and comment was submitted to the *Corvallis Gazette-Times*. Letters with the same information were mailed to interested individuals.
- Copies of the EA are being mailed to individuals, interest groups and agencies.

C. Management Objectives by Land Use Allocation and Resource Program

As directed by the Northwest Forest Plan and the RMP, the primary management objectives for the project area are as follows:

Matrix (GFMA) (RMP pp. 20-22)

1. Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability.
2. Provide connectivity (along with other allocations such as Riparian Reserves) between Late-Successional Reserves.
3. Provide habitat for a variety of organisms associated with both late-successional and younger forests.
4. Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
5. Provide early successional habitat.

Riparian Reserves (RMP pp. 9-15)

1. Provide habitat for special status, SEIS special attention and other terrestrial species.
2. Meet Aquatic Conservation Strategy objectives.

Late-Successional Reserves (RMP pp. 15-18)

1. Late-Successional Reserves (LSR) are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for Late-Successional and old-growth forest-related species including the northern spotted owl and marbled murrelet.
2. Maintain a functional, interacting, late-successional and old-growth forest ecosystem.

Water and Soil Resources (RMP pp. 22-24)

1. Comply with State of Oregon water quality requirements to restore and maintain water quality and to protect recognized beneficial uses in watersheds.
2. Improve and/or maintain soil productivity.

Special Status and SEIS Special Attention Species (RMP pp. 29-31)

1. Protect, manage and/or conserve habitat for these species so as not elevate their status to any higher level of concern.

Timber Resources (RMP pp. 46-48)

1. Manage developing stands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest.

Visual Resources (RMP pp. 36)

1. Minimize visual impacts in areas adjacent to the South Fork Alsea Backcountry Byway.

Noxious Weeds (RMP p. 64)

1. Avoid introducing or spreading noxious weed infestations in any areas.

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. INTRODUCTION

This section describes alternatives identified by the interdisciplinary (ID) team that helped develop the Gotaway Project. This environmental assessment (EA) analyzes the proposed action, which would involve density management harvest in conifer stands on Riparian Reserve and Late-Successional Reserve lands. Conifer release in hardwood dominated stands within Matrix, Late-Successional Reserves and Riparian Reserves would promote the growth and survival of existing conifers. Hardwood conversion within Matrix lands would develop a diversity of species dominated by a single canopy of hardwoods and create future coarse wood debris within convertible lands. Important ecological components within the project area would be retained. Forest management treatments incorporated in the proposed action conform with standard practices and design features intended to reduce the environmental effects of timber harvest and related activities. They comply with the Standards and Guidelines specified in Appendix A of the *ROD*.

B. SUMMARY OF ALTERNATIVES

Alternative 1 (Proposed Action)

Under the proposed action, commercial thin and density management harvest using ground-based logging system would remove a portion of the trees on approximately 219 acres of 35 to 50 year-old trees. Conversion of hardwood stands (red alder) to conifer stands on 7 acres of Matrix and 2 acres of Late Successional Reserve lands, conifer release on 1 acre of late successional reserve, riparian reserve and matrix lands, and road renovation and closure would occur. Some stand structural diversity would be retained. (Refer to Section II. C, Project Design Features for further details.)

Alternative 2 (No Action)

Density management, commercial thinning, conifer release, hardwood conversion of the stands and road renovations and closures would not occur.

C. ALTERNATIVE 1 (PROPOSED ACTION)

1. Scoping Issues

The following issues concerning the proposed action were identified through public scoping and by an ID team of BLM natural resource specialists representing various fields of science (see Section V, Interdisciplinary Team Members). Issues that were considered but eliminated from further analysis are documented in Appendix B, Environmental Elements Review Summary.

Vegetation: Effects on native vegetation and special status/SEIS special attention species and habitats and noxious weeds.

Soils/Fuels: Effects on long-term site productivity as related to soil compaction. Effects on fuel loading and fire risk.

Water/Riparian: Effects on stream flow, channel conditions and water quality and aquatic conservation strategy objectives.

Wildlife: Effects on special status, SEIS special attention and other wildlife species and their habitats.

Fisheries: Effects on fisheries and their habitats.

Visual: Effects on VRM II designated lands.

D. PROJECT DESIGN FEATURES, MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

Project design features are operating procedures that would be included in the design and implementation of the proposed action alternative. They also include measures proposed to

mitigate potential adverse environmental effects. The design features of this proposal are described below. These measures are described in Appendix C, Best Management Practices and Timber Production Capability Classification Fragile Code Guidance in the *Salem District Resource Management Plan* (May, 1995). Copies of this document can be obtained in the Salem District Office or through the internet at www.or.blm.gov/salem. All acres and other numerical units are approximate.

General

- Stand density would be reduced through harvest on 219 acres of 35 to 50-year-old trees in Riparian Reserves, Matrix (GFMA) and Late Successional Reserve.
- Four thousand five hundred feet of existing road would be renovated and closed after the completion of operations. Renovation would include one or more of the following: brushed, bladed, rock placement and shaped to provide for timber haul. Closure would include one or more of the following: road entrance would be bermed or debris piled, culvert removed, water-barred after completion of timber hauling.
- Road renovations and closures would be restricted to periods of low precipitation (generally June through October) in order to limit soil erosion.
- The cut trees would be removed by either harvester/forwarder and/or crawler tractor equipment.
- Impacts related to Visual Resource Management Class II lands would be seen but would not attract the attention of the casual observer.
- The project area would be outside Rural Interface Areas with the closest residence approximately 4 air miles from the project area.

Vegetation (General)

- In accordance with the RMP (pp. 28-33), appropriate measures would be taken to protect special status plant species or additional SEIS special attention plant species discovered prior to selling the timber.
- Except for a few openings located in the hardwood conversion areas, a minimum of 40 percent canopy closure would be maintained throughout the harvest area.
- All exposed mineral soil areas (roads to be renovated, cat/skid roads, landings) would be grass seeded with Oregon Certified (Blue tagged) red fescue (*Festuca rubra*) at a rate equal to 40 pounds per acre.

Vegetation (Matrix Thinning)

- Approximately 67 acres of conifer forest on Matrix (GFMA) lands would be commercially thinned by cutting and removing suppressed trees and a limited number of co-dominant trees. Table 1 compares the present conditions in the sale area to the proposed action with respect to trees per acre and basal area per acre which would be retained.

Table 1. Thinning harvest comparison for Units in GFMA allocation

Unit #	Acres	Trees per acre before thinning	Trees per acre after thinning	Basal area per acre before thinning (square feet.)	Basal area per acre after thinning (square feet.)
1	9	230	116	161	110
4	7	230	116	161	110
6	6	140	85	219	150
7	23	309	99	265	150
9	11	293	140	164	110
11	11	199	101	214	130

- Where the existing basal area is below 100 square feet, a minimum of 80 square feet would be maintained by requiring spacing to be less than 10 feet apart. Commercial thinning would be accomplished by cutting approximately 80 percent of the trees less than the mean diameter of the residual stand, using basal area and spacing for marking guidelines.
- All trees not specifically identified for retention would be cut to release residual trees.
- Dominant and large residual trees would be retained, except where they pose a hazard to on-site workers, where they are located within yarding corridors, or where removal is required for proper spacing of residual trees. Trees without crook, sweep, broken tops, multiple tops, scarring, and disease would be targeted for retention. An occasional tree with broken or multiple tops, scarring, and disease would be targeted for retention.
- Hardwoods and conifers other than Douglas-fir, western hemlock and grand fir would be reserved throughout the treatment area, except where they pose a safety hazard, where they are within yarding corridors, or to facilitate logging. These trees would be removed from the site if economically feasible. Western hemlock and grand fir would be retained over Douglas-fir of the same quality for leave trees.
- Approximately 7 acres of red alder dominated forest on Matrix lands (portion of unit 7 hardwood conversion area) would be cut and yarded. Unmerchantable material would be grapple and/or shovel piled, covered with plastic and burned during the wet season. Compacted areas designated by the Authorized Officer would be sifted using grapples or shovel tongs to loosen the compaction. The area would be planted with a mixture of western hemlock, western red cedar and Douglas-fir. Existing conifer trees would be reserved and protected where feasible.
- Approximately 0.5 acre of hardwood overstory/conifer understory forest on Matrix

would be treated by cutting and yarding a portion of the red alder overstory. Existing conifer trees would be reserved and protected where feasible. The retained portion of red alder would provide approximately 60 percent full sunlight to the existing conifers. The additional light provided to the existing conifer understory would enhance their overall growth and viability.

Vegetation (Riparian Reserve and Late-Successional Reserve)

- Approximately 0.5 acre of hardwood overstory/conifer understory forest on Riparian Reserve and Late-Successional Reserve would be treated by cutting and yarding a portion of the red alder overstory. Existing conifer trees would be reserved and protected where feasible. The retained portion of red alder would provide approximately 60 percent full sunlight to the existing conifers. The additional light provided to the existing conifer understory would enhance their overall growth and viability. A mixture of Douglas-fir, western hemlock and western redcedar would be planted where appropriate.
- Approximately 152 acres of conifer forest on Riparian Reserve and Late-Successional Reserve lands would be density managed by cutting and yarding suppressed trees and a limited number of co-dominant trees. Table 2 provides a comparison of present conditions in the sale area to the proposed action with respect to trees per acre and basal area per acre which would be retained.
- Approximately 2 acres of red alder dominated forest on Late Successional Reserve lands (portion of unit 9 hardwood conversion area) would be cut and yarded. Unmerchantable material would be grapple and/or shovel piled, covered with plastic and burned during the wet season. The area would be planted with a mixture of western hemlock, western red cedar and Douglas-fir. Existing conifer trees would be reserved and protected where feasible.
- Dominant and large residual trees would be retained, except where they pose a hazard to on-site workers, where they are located within yarding corridors, or where removal is required for proper spacing of residual trees. Some co-dominants and healthy intermediates with crown ratios over 30 percent would also be left to contribute to a short term second canopy layer. Cut trees, with a few exceptions, would be yarded. Although it is expected that some understory conifers would seed in, conifers would be planted where appropriate to eventually become a second canopy layer.
- Cut additional trees in areas where healthy understory would benefit from additional light, and around large “wolf” trees, providing them an open grown condition.
- Where appropriate, additional trees would be reserved around snags to serve as protection.
- Where operationally practicable, conifer trees (except Douglas-fir) less than 5 inches DBH would be reserved.
- Existing CWD and snags would be reserved where safety allows.

- Trees would be felled away from stream protection areas and fungus protection areas within one tree height of these areas. Where a cut tree does fall within these areas, do not yard that portion of the tree.
- All species except Douglas-fir would be reserved in units 1-5, 9, 11 and 12. All species except Douglas-fir and western hemlock would be reserved in Units 8 and 10.
- Stands would be evaluated for second density management treatments when the upland portion of the stands in the Matrix (GFMA) are evaluated for regeneration harvest (approximately 30 years).
- Coarse woody debris would be created prior to completion of operations. A minimum of 1 tree per acre would be left on site prior to completion of contract requirements by:
 - ▶ Where it is necessary to cut reserve trees greater than 20 inches DBH for yarding roads, do not remove.
 - ▶ If insufficient CWD is created by the above method then reserve trees would be felled and left immediately following harvest operations (less than 2 months). Conifers to be cut would be equal to or greater than the average stand diameter.
 - ▶ Post harvest monitoring would take place within four years of exposure to windthrow and bark beetles. At this time the stands would be evaluated for CWD/ snags adequacy and an additional two to six CWD/snags per acre would be created where necessary.
- Cuttings from willow (*Salix scouleriana*) would be collected in the project area in February through March. Cuttings would be planted by hand. Willow planting would be limited initially to small demonstration areas along the banks and floodplain of the South Fork Alsea main channel in Section 31, T. 14 S., R. 6 W. Once methods appropriate for this area have been tested and plantings have been successfully established they would be expanded laterally along the main channel.

Table 2. Density management comparison for Units in Riparian Reserve and LSR.

Unit	Acres	Trees per acre before thinning	Trees per acre after thinning	Basal area per acre before thinning (square feet)	Basal area per acre after thinning (square feet)
1	13	211	95	160	110
2	2	309	87	234	110
3	4	167	77	157	110
4a	9	210	103	118	80
4b	11	297	89	200	110
4c	17	309	87	234	110
5	15	305	83	204	110
6	2	140	85	219	150
7	8	309	99	265	150
8	17	235	93	209	140
9	10	309	98	169	100
10, 11	32	198	80	214	130
12	12	207	76	191	120

Survey and Manage Species

- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the S&M ROD, January 2001 and the S&M FSEIS.

This would include the following:

Species removed from Survey and Manage Protection Buffers and Protect from Grazing in All or Part of their Range (Table 1-2, S&M ROD, January 2001,)

Lobaria oregana, *L. pulmonaria*, *L. scrobiculata*, *Nephroma resupinatum*, *Pseudocyphellaria anomala*, *P. anthraxis*, *P. crocata*, *Peltigera collina*, *Antitrichia curtipendula*, *Omphalina ericetorum*, *Cantharellus formosus* and *Gomphus floccosus*

No special management is required.

- Category B Species located in the project area (Table 1-1, S&M ROD, January, 2001)

Bondarzewia montana, *Clitocybe senilis*, *Ramaria araiospora*, *R. celerivirescens*, *R. cyaneigranosa* and *R. stuntzii*,

Management of these species would be accomplished as known sites as stated on page 9 of the *S&M ROD* and Management Recommendations for Fungi Version 2.0 (Castellano & O'Dell, Sept.1997).

- Category D Species located in the project area (Table 1-1, S&M ROD, January, 2001) *Chalciporus piperatus*, *Cantharellus subalbidus* and *Craterellus tubaeformis*.

Management of these species would be accomplished as known sites as stated on page 9 of the *S&M ROD* and Management Recommendations for Fungi Version 2.0 (Castellano & O'Dell, Sept.1997).

Soils

- Existing skid roads would be used for harvester/forwarder and/or crawler tractor roads as much as possible.
- Harvester/forwarder corridors would be spaced a minimum 60 feet apart and less than 15 feet in width.
- Unmerchantable material would be placed in yarding corridors to minimize the need for machines to go on bare soil.
- Harvester/forwarder equipment would be restricted to periods of low soil moisture (generally July 15 to October 15). Operations may occur outside of these restricted times if all of the following conditions are met:
 - ▶ The area is narrow enough to be harvested with one pass of the loaded forwarder, or
 - ▶ Machines are kept on areas with heavy slash accumulations in order to distribute the weight over a large area and minimize top soil disturbance. Placement of additional slash on harvester/forwarder trails would probably be necessary in most cases.
 - ▶ The operation is frequently monitored (at least every other day) to ensure that significant soil compaction does not occur.
 - ▶ Operations are shut down at the first indication of significant soil compaction.
- Crawler tractor equipment would be limited to tractors with a blade less than eight feet in width and tractor must be equipped with an integral arch.
- Existing skid roads would be utilized as much as possible. All tractor yarding roads would be spaced approximately 150 feet apart and be a maximum of 12 feet in width.
- Tractor yarding would be restricted to periods of low soil moisture (generally between

August 1 to October 15).

- Equipment would be required to operate on top of slash as much as practical on designated skid roads.
- Roads to be renovated would be blocked with a ditch/berm and or logging debris following harvest.
- Skid roads on slopes over 8 percent, or where obvious channeling of water has or is occurring, would be water barred. The purpose of the water bars would be to reduce surface erosion by returning water onto slopes where it can infiltrate.
- Small landings would be constructed at various points along the existing roads. Any landing construction involving cut and fill as well as initial grading of the roads to make them passable should be restricted to periods of dry weather (generally June 1 to October 31). Timber hauling on roads to be renovated would be restricted to periods of low rainfall (between May 1 and October 31)
- Reserve trees would be felled and left within ditch #1 in Unit 4 at locations to be determined by the Authorized Officer.

Water/Riparian

- Stream protection area (a minimum 25-foot buffer for all streams except for the main stem of the South Fork Alsea River which would have a minimum 50 feet buffer) would be maintained.
- Fall trees away from the stream protection areas. Where a cut tree does fall within a stream protection area (reserve), the portion of the tree within the reserve would remain.
- Prohibit equipment operations within an additional 20-foot protection area adjacent to the stream protection areas.
- Approximately 4 conifers per acre (4 trees per 900-1700 feet of perennial streams) would be cut and left in or adjacent to all fish-bearing streams in the project area, immediately after the sale is completed. It is expected that these trees would come from inside or adjacent to the stream protection areas, and would only be cut where sufficient conifers occur along those portions of the streams. Conifers to be cut would be equal to or greater than the average stand diameter. Project would be accomplished by BLM personnel or service contract, and subject to funding.
- Additional trees could be cut and placed in streams in the project area at the same time that additional upland CWD is created (approximately 3 to 4 years after the sale). Numbers of logs placed in or near streams at that time would be determined by the resource area fisheries biologist and subject to guidelines established for the Siuslaw National Forest for minimizing bark beetle infestation (Appendix E). Both projects would be accomplished by BLM personnel or service contract, and subject to funding.

Wildlife/Fisheries

Special Status Species

- All project operations and associated activities would be conducted in conformance with the applicable Biological Opinion (currently: # 1-7-00-F-649) concerning listed wildlife species. Pertinent "Terms and Conditions" from the BO include:
 - ▶ From April 1 through September 15, restrict daily use of power equipment to two hours after sunrise and two hours before sunset on all project activities associated with Units 1, 2, and 12;
 - ▶ Notify the Resource Area Biologist if any federally listed wildlife species are found occupying stands proposed for treatment.
- Existing down logs and snags would be retained except where they pose a safety risk, or affect access and ability to operate. Any existing down logs or snags moved or felled would remain on site within the project area.

Survey and Manage

- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

Species located in the project area that have been removed from Survey and Manage Protection Buffers and Protect from Grazing in All or Part of their Range (Table 1-2, January 2001, Survey and Manage Standards and Guides)

Blue-Grey Tail dropper (*Prophyaon coeruleum*)

No special management is required.

Visual Resources

- Clearing limit debris adjacent to roads to be renovated would be removed within 100 feet of Road 14-6-34.1 (South Fork Alsea Access Road). Road width clearing and brushing would be minimized on roads to be renovated. Entrances to roads to be renovated would be closed by establishing a ditch and berm immediately adjacent to the beginning of these roads.

Summary of Seasonal Restrictions

The following is a summary of seasonal restrictions:

MANAGEMENT ACTIVITY	RATIONALE	NO ACTIVITY BETWEEN THESE DATES AND/OR TIMES
FALLING, YARDING	BARK SLIPPAGE	APRIL 15 TO JULY 15
ROAD RENOVATION AND CLOSURES	SOIL EROSION	NOVEMBER 1 TO JUNE 1
TIMBER HAULING	SOIL EROSION	NOVEMBER 1 TO APRIL 1
GROUND-BASED YARDING (HARVESTER/FORWARDER)	SOIL COMPACTION	OCTOBER 15 TO JULY 15
GROUND-BASED YARDING (TRACTOR)	SOIL COMPACTION	OCTOBER 15 TO AUGUST 1
POWER MACHINERY USE IN UNITS 1, 2 AND 12	MARBLED MURRELETS	APRIL 1 TO SEPTEMBER 15 2 HOURS BEFORE SUNSET TO 2 HOURS AFTER SUNRISE

COMPARISON OF ENVIRONMENTAL CONSEQUENCES, BY ALTERNATIVE, FOR IDENTIFIED ISSUES.

Issue	Alternative 1	Alternative 2
Vegetation (Matrix)	Reduces stand densities ranging from a minimum of 85 conifer trees per acre (TPA) to a maximum of 140 conifer TPA after completion of operations.	Stands needing treatment would be deferred, resulting in a loss of productivity. Future yields of timber would be reduced due to slowing stand growth.
Vegetation (Riparian Reserve and Late-Successional Reserve)	Reduces stand densities ranging from a minimum of 76 conifer TPA to a maximum of 103 conifer TPA after completion of operations.	Time frame for Riparian Reserves and Late-Successional Reserve to attain late-successional forest characteristics would lengthen, opportunities to enhance structural development would not occur.
Vegetation (General)	Increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid-canopy and ground levels. Understory initiation of shade-tolerant conifers would be promoted in areas of increased light. In the interim, a more complex understory would develop, consisting of more shrub species and planted conifers.	
	Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average diameter breast height (DBH), and larger crowns (higher crown ratios) at any given age	

Issue	Alternative 1	Alternative 2
Soils	Residual compaction within RMP standards.	Continuation of current conditions.
Water/Riparian/Fish	<p>No measurable affect on physical integrity, water quality, sediment regime or in-stream flows. Short-term, variable increase in stream turbidity may occur.</p> <p>Stream protection areas protected by minimum 25 and 50 feet no-entry buffers. Additional 20 feet no-entry of equipment adjacent to the stream protection areas. Enhance structural and species diversity, restore riparian ecosystem functions.</p> <p>No adverse impacts to fish or fish habitat anticipated.</p>	<p>Continuation of current conditions and trends.</p> <p>Single canopy stands lacking structure and species diversity. May take 45 years to attain understory or no understory.</p> <p>No effects to resident fish. No effects to aquatic ecosystem.</p>
Wildlife	<p>Would not result in direct, indirect, or cumulative impacts to wildlife species or their habitat, beyond those anticipated to occur within the existing RMP. Site specific concerns for all wildlife species, especially federally listed and Survey and Manage species have been adequately addressed and mitigated by design features.</p> <p>Likely to improve overall quality of habitat for many species in the long-term.</p>	<p>Avoids short-term risk to habitats and species, but foregoes the desirable long term benefits to habitat structure included in the proposed action.</p>
Visual	<p>Potential unauthorized off-road vehicle use from road renovation adjacent to S. F. Alsea Access Road. Current illegal dumping of garbage could decrease by closure of roads</p>	<p>The majority of existing roads to be renovated and closed are overgrown; unauthorized off road use does not currently occur. The current dumping of garbage could continue or increase.</p>

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT/ ENVIRONMENTAL CONSEQUENCES

The following descriptions are the environmental features affected by timber harvest and associated activities. A documentation of no affect to resources where review is required by statute, regulation, or executive order is included in Appendix B. See BLM Manual, Sec. 1790, Appendix 5. Resource values are not described in this section if there are no anticipated site-specific impacts, site-specific impacts are considered negligible, or the cumulative impacts described in the existing RMP EIS are considered adequate.

A. GENERAL

The proposed project is located in Township 14 South, Range 6 West, Section 31, Township 14 South, Range 7 West, Sections 25, 26 and 35, Township 15 South, Range 6 West, Section 6, W.M. in the South Fork Alsea River Watershed. Land use allocations for the project area are Matrix (General Forest Management Area [GFMA]), Riparian Reserve and Late Successional Reserve.

B. TOPOGRAPHY

The project area is situated primarily on a large flat with no distinctive aspect. Elevation varies from 840 to 1,300 feet. Slopes range from 0 to 15 percent, with small areas of up to 35 percent.

C. VEGETATION

Issue: Effects on native plant species, Special Status Species or Special Attention Plant Species, and noxious weed species on site.

Vegetation: Affected Environment

The proposed project is located in a mixed coniferous forest. This forest is typical of those described in the western hemlock plant association series of Western Oregon. The average age of the conifers within the project area are approximately 45 years of age. The average diameter is 13 inches DBH. There are approximately 200 trees per acre with an average canopy closure of 80 percent. Site class II and site index 135 was calculated using stand exam data for the project area.

The stands in the proposed project area were logged in the 1960's, are relatively young (33 to 51 years) and are densely stocked with relative densities ranging from .41 to .77 (Table 3). Crown ratios are high and canopy closures are all greater than 70 percent. The majority of the upland canopy within the project areas are mainly dominated by Douglas-fir. However, western hemlock is also common within the stands and in areas are co-dominant with the Douglas-fir. Grand fir occurs in units 1 and 5 and western red cedar and pacific yew are scattered throughout the units. Red alders are often dominant adjacent to the aquatic systems and in low lying "wet" areas throughout the contract area and are dominant in a few of the project areas that were previously logged where red alder out-competed the conifers.

The understory species are mainly California hazelnut and vine maple. These species abundance ranges from several to scattered to forming thickets in some areas. Many areas do not have any understory species. The shrub and forb layers are mainly dominated by salal, sword-fern, Oregon grape or in many areas there is no shrub or forb vegetation due to low light levels. Forest surveys were conducted in 1996, 1998 and 1999. Specific stand data is available in the project file.

Root rot (*Phellinus*) is known to occur in small sporadic pockets. It is also common and widespread throughout the resource area and Western Oregon. Douglas-fir bark beetles are also known to occur within these “root rot areas” in the project area and Western Oregon.

Major plant grouping as listed in the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (V.1, chapter 3, pp.29-32) is the Douglas-fir/Red Alder/Salmonberry grouping which occurs on the west slopes of the Oregon Coastal Mountains. More specifically the area is comprised of the following plant associations in which the *western hemlock/salal* and *western hemlock/vine maple/sword-fern* associations are the most common and most abundant.

The *w. hemlock/salal plant association* is common on upper slopes and ridges. The soils are moderately deep and well drained.

The *w. hemlock/Oregon grape/salal plant association* is mostly a transition area between the above two associations. It occurs at upper slopes with well drained soils.

The *w. hemlock/sword-fern plant association* is common throughout the forest. It occurs on steep and lower slopes or, less often, on benches and alluvial flats. Soils are well-drained but receive continuous subsurface moisture from up-slope. Soils are usually deep and rich in organic matter.

The *w. hemlock/vine maple/sword-fern plant association* is most common on relatively warm, well-drained middle and lower slopes.

Table 3

Stand Structure by Unit

Unit	Age	Trees/Acre	Basal Area (sq.ft)	Average DBH (inches)		RD ¹	Crown Ratio (percent)	Crown Closure (percent)
1	39	211	160	DF 11.2	GF 11.7	.53	49	50
2	47	309	234	DF 11.2	WH 10.4	.77	29	78
3	34	167	157	12.6		.50	44	80
4a	33	210	118	10.2		.41	53	82
4b	38	297	200	DF 10.4	WH 11.2	.67	33	75

Unit	Age	Trees/Acre	Basal Area (sq.ft)	Average DBH (inches)		RD ¹	Crown Ratio (percent)	Crown Closure (percent)
4c	47	309	234	DF 11.2	WH 10.4	.77	29	78
5	36	305	204	DF 14.2	GF 15.5	.69	35	71
6	45	140	219	14		.53	36	78
7	45	309	265	13		.75	32	86
8	50	235	209	DF 12.3	WH 11.5	.67	31	73
9	34	309	169	9.4		.59	34	79
10, 11	45	198	214	DF 13.1	WH 18.5	.57	32	79
12	51	207	191	12.2		.61	40	77

Notes:

1. RD (relative density) is a ratio: trees per acre in a stand adjusted to a 10 inch diameter, divided by the number of trees per acre in a fully stocked stand 10 inches in diameter (595 for DF). 0.35 RD is the point where growth slows from competition. 0.6 RD is a point where competition begins to cause mortality.

Survey and Manage

Vascular plants

Inventory of the project area for survey and manage vascular plant species was accomplished in accordance with the survey protocols as described on page 3 of survey *Protocols for survey and Manage strategy 2 Vascular Plants, version 2.0, December 1998*. Specific surveys for all listed special status and special attention vascular plant species were accomplished on June 22nd, 23rd, July 1st, 19th, 21st, 1999 and June 29th, July 6th, 10th, 11th, 12th, 2000. A list of all species looked for with the proposed project area is attached.

Special Status Species:

There are no “known sites” of any special status vascular plant species within the project area.

Special Attention Species:

There are no “known sites” of any special attention vascular plant species within the project area.

Lichens

Inventory of the project area for survey and manage lichens were accomplished in accordance with the survey protocols as described within the *Survey Protocols for Component 2 Lichens version 2.0, March 12, 1998*. Inventories for newly assigned lichen species into categories "A" and "C" of the S& M ROD that currently have no protocols were surveyed using the intuitive control method. However, pre-disturbance surveys for these species may not be required for up to two years as described on page 23 of the S&M ROD. Specific surveys for all listed special status and special attention lichen species were accomplished on June 22nd, 23rd, July 1st, 19th, 21st, 1999 and June 29th, July 6th, 10th , 11th , 12th, 2000.

Special Status Species:

There are no "known sites" of any special status lichen species within the project area.

Special Attention Species:

Lobaria oregana, *L. pulmonaria*, *L. scrobiculata*, *Nephroma resupinatum*, *Pseudocyphellaria anomala*, *P. anthraspis*, *P. crocata* and *Peltigera collina* were found within the proposed project area. All were previous Northwest Forest Plan special attention lichen species and are included in, *Species Removed from Survey and Manage, Protection Buffers and Protect From Grazing in all of Part of Their Range* (Table 1-2, S&M ROD).

Bryophytes

Inventory of the project area for survey and manage bryophytes was accomplished in accordance with the survey protocols as described in *Survey Protocols For Survey and Manage Component 2 Bryophytes, version 2.0, December 1997* and *Survey Protocols for Protection Buffer Bryophytes, version 2.0, December 1999*. Specific surveys for all listed special status and special attention bryophyte species were accomplished on June 22nd, 23rd, July 1st, 19th, 21st, 1999 and June 29th, July 6th, 10th , 11th , 12th , 2000.

Special Status Species:

There are no "known sites" of any special status bryophyte species within the project area.

Special Attention Species:

Antitrichia curtipendula a Northwest Forest Plan special attention bryophyte species was found in several locations within the proposed project area. It is included as *Species Removed from Survey and Manage, Protection Buffers, and Protect From Grazing in all of Part of Their Range* (Table 1-2, S&M ROD).

Fungi

Inventory of the project area for survey and manage fungi species was accomplished in accordance with *Plan Maintenance Documentation: Decision to Delay the Effective date for Surveying 7 "Survey and Manage" and Protection Buffer Species* (March 8, 2000). Specific

surveys for all listed special status and special attention fungi species were accomplished on October 11th, 12th, 25th and 26th and November 13th, 2000.

Special Status Species:

There are no “known sites” of any special status fungus species within the project area.

Special Attention Species:

Omphalina ericetorum, *Cantharellus formosus* and *Gomphus floccosus* were all found within the proposed project areas. All are included on *Species Removed from Survey and Manage, Protection Buffers, and Protect From Grazing in all of Part of Their Range* (Table 1-2, S&M ROD).

Category "B" fungi species found within the project area include; *Bondarzewia montana*, *Clitocybe senilis*, *Ramaria araiospora*, *R. celerivirescens*, *R. cyaneigranosa* and *R. stuntzii*.

Category "D" fungi species found within the project are include; *Chalciporus piperatus*, *Cantharellus subalbidus* and *Craterellus tubaeformis*.

One category "F" species, *Otidea onotica*, was found within the project areas.

Noxious Weeds

The following noxious weeds are known from within or adjacent the project area, Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John's wort (*Hypericum perforatum*) and Scot's broom (*Cytisus scoparius*).

Course Woody Debris (CWD)/Snags

The *SFAWA* does not specifically address CWD in the Riparian Reserves or LSRs. The *RRTRU* recommends for density management projects in Riparian Reserves, that the recommendations of the wildlife biologist and the *LSRA* be followed. As Table 4 indicates, two units (1 and 9) do not meet *LSRA* cubic foot CWD requirements, and one barely meets them. All units lack down wood in decay classes 1 and 2, and decay class 1 and 2 snags are smaller and/or fewer than recommended.

Table 4

Coarse Woody Debris Data

Unit	CWD (cu. ft/ acre) ¹	CWD Decay Class 1-2 (pieces/acre >8')	CWD Decay Class 3-5 (pieces/acre >8')	Snags (#/acre)	Snags DBH/ size range
1	145	3.3	13.7	0	
2	1619	0	91.2	2.5	25.0" 24.0"-26.0"
3	2216	0	61.2	59.3	6.6" 6.0"-14.0"
4 ²	1027	3.8	22.1	29.4	8.7" 7.0"-14.0"
5	545	0	35.6	22.1	11.5" 7.0"-18.0"
6	860	0	19.5	53	6.0" 6.0"-60"
7	2150	6.6	13.6	60	9.0" 6.0"-11.0"
8	5656	18.1	50.9	54	8.7" 7.0"-40.0"
9	403	8.6	28.5	0	
10,11	5574	11.3	31.3	0	
12	1767	0	2.7	11.8	13.0" 7.0"-14.0"

1 Using strategy #3 described in the *LSRA*, required short term CWD minimums from Table 12 (p.61) range between 525 and 2844 cubic feet.

2. Data from 4a, 4b, and 4c were averaged.

Vegetation: Environmental Consequences**Alternative 1 (Proposed Action)**

The decrease in the canopy cover would allow for an increased amount of energy to the tree, shrub, forb and grass species. The increase in energy would allow these species to increase in density and/or increase in height and girth. Many non-vegetated, slash covered areas, would become dominated by shrub and/or fern species. Eventually it is expected that the canopy cover would increase to 80 percent or to approximately just under the levels prior to thinning.

The proposed action would provide conditions for healthy well-spaced stands with the best

combination of tree size and total wood volume for the rotation of the stands. Larger diameter trees would provide higher quality timber and trees for wildlife needs in the future than the no action alternative. The retention of green trees with high wildlife quality (large limbs, boles, and crowns) snags, and logs (CWD) would help provide for ecological functions. The increase of canopy openings would provide some early successional habitat qualities. These stands are expected to be ready for regeneration harvest with high quality trees to harvest and with large green trees to reserve for ecological function at culmination from 70 to 110 years of age. As the stands approach final harvest age, trees greater than 20 inches diameter are expected to produce timber and wildlife trees for both snags and CWD in the future stands. By not falling trees now for CWD, the trees will continue to grow becoming more desirable as wildlife habitat.

Areas designated as hardwood conversion areas would have all of the existing hardwoods severed and removed from the project area. The severance of the red alders from the conifer release areas would allow for an increase in energy and would accelerate growth to the existing conifers. The areas would be dominated by conifers in the future.

Roads renovation would include the removal of any existing vegetation and top soil in those areas. Mineral soil would be exposed and become available for the establishment of early successional plant species and noxious weeds.

The stems of the severed conifers would be removed from the project area. The tops, branches and broken/shattered stems would remain on site to decay. Some of the broken stems and larger diameter tops would provide habitat for the Douglas-fir bark beetle. In the unlikely event of a large infestation of these beetles, some reserved Douglas-fir trees may be killed in the following 1 to 5 years. Subsequent infestations are not likely after approximately 5 years. If standing trees are killed it would create snags which are valuable for wildlife. Blown-down timber may also occur post harvest in the thinned areas creating additional coarse down woody debris and may lead to an increase in the Douglas-fir bark beetle populations.

Thinning could help reduce the spread of (*Phellinus*) if those trees affected with the fungus are severed and removed from the stand. Thinning would not have any significant negative effects on the spread of this disease.

Survey and Manage

Lichens

Special Attention Species:

None of the lichen special attention species would receive any special protection from the thinning operations. All species are fairly common within the range of the Forest Plan. Some of these known sites may be destroyed if the host tree is severed or damaged and dies. Future wind-throw may also remove some of the host trees resulting in the removal of some of the existing known sites. However, thinning and increasing sunlight to the stand may result in a net increase in the habitat for several of these lichen species.

Bryophytes

Special Attention Species:

None of the *Antitrichia curtipendula* sites would receive any special protection from the thinning operations. Some of these known sites within the project area may be destroyed if the host tree is severed or damaged and dies. Future wind-throw may also remove some of the host trees resulting in the removal of some of the existing known sites.

Fungi

Special Attention Species:

All of the known sites of all category B and D species would be withdrawn from any type of harvest considerations and would be protected. No harvest operations would occur within or above these reserved areas, which would minimize any type of ground disturbances.

All of the category F *Otidea onotica* species known sites would not receive any special protection from the thinning operations. This species is common throughout most of the contract area. Some of these known sites within the thinning area may be negatively impacted by logging operations.

Noxious Weeds

These species are priority III noxious weeds and are well established and widespread throughout the Mary's Peak Resource Area and the Salem District. Eradication is not practical using any proposed treatment methods. Grass seeding exposed soil areas tends to decrease the establishment of non-native and noxious weeds. Any adverse effects from noxious weeds are not anticipated. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low.

Coarse Woody Debris

Desirable snag and CWD characteristics would be enhanced in 2 ways:

1. Trees smaller than stand average and at a consequently higher risk of mortality, would reach an average 20 inches DBH more quickly, compared to the no treatment option, creating natural opportunities for larger snag/CWD formation. Average snag/CWD DBHs in Table 7 range from 12 percent to 53 percent larger than in the no treatment alternative.
2. Coarse Woody Debris and snag enhancement would be achieved using strategy # 3 as described in the *LSRA* (p.68). This strategy creates some short term CWD and snags, but reserves most as green trees to maximize long-term quantities and sizes of CWD and snags. Post harvest monitoring would be accomplished to evaluate the size and condition of snags and CWD. It is expected the harvest operation would create some CWD and possibly knock down some snags. Creation of CWD during harvest could come from harvest activities, post harvest windthrow, and beetle kill. The monitoring would be done three years after the harvest has maximized

opportunities for natural creation of CWD and snags. After monitoring, two to six trees per acre would be cut and left where needed to supply hard CWD. Snags would be created where needed to meet recommendations of the biologist. Following CWD scenario # 3 in the *LSRA*, most CWD and snags would be left as green trees until the upland portion of the project area is regeneration harvested. At that time additional CWD and snags would be created in the Riparian Reserves .

Alternative 2 (No Action)

Matrix (GFMA)

Growth of existing trees would be slow compared to Alternative 1 (see Table 7) and the upland stands would not reach growth and health conditions desired for general forest management. The predominately existing sparse ground cover and single canopy conditions would continue until the stand began to naturally self thin as the crown canopy closed over time, creating small diameter CWD in the short term. This would increase the light level in the stand thus increasing ground and shrub growth. The stands would have less vertical structure and poor height to diameter ratio than the managed stand due to the past crowded stand conditions. This condition would cause an increase in susceptibility to future windthrow. The residual trees would not be as vigorous or have desired structure than the managed stands in the proposed action. This process would result in not reaching or in slower attainment of desired tree diameter, crown and wood quality for GFMA objectives.

D. SOILS/FUELS

Issue: Effects on long term-site productivity as related to soil compaction and displacement. Effects on fuel loading and fire risk.

Soils/Fuels: Affected Environment

Soils

The predominant soil series on and around these sites are Blachly clay loam (units 1, 2, 3, 4, 7, 10, 11 and 12), Bohannon gravelly loam (units 10 and 11), Chitwood silt loam (units 4, 6, 7, and 8), Klickitat gravelly clay loam (unit 11), Marty silty clay loam (units 7, 8, 9 and 12), Preacher clay loam (unit 7), and some Sandy Alluvial soils in units 4 and 5 primarily in riparian zones.

Blachly soils are deep, well-drained, gently to moderately sloping soils that developed from alluvial and colluvial materials derived from arkosic sandstone. The surface soils are a dark-brown clay about 9 inches thick with a layer of decomposed and fresh plant litter on the surface. The sub-surface soil is over 80 inches thick and is dark-red and dark reddish-brown clay. Strongly weathered and fractured rock is at a depth of approximately 90 inches.

Bohannon soils are moderately deep, well-drained soils that formed in colluvium weathered from sandstone. They are found on Coast Range sites at elevations from 1000 to 3500 feet. Slopes range from 25 to 75 percent. Typically, the surface soil is a very dark-brown and dark brown gravelly loam about 18 inches thick. The sub-soil is a dark brown gravelly loam about 17 inches thick. It is underlain by sandstone bedrock at a depth of about 35 inches.

Chitwood soils are deep, moderately well to somewhat poorly drained, level to gently sloping soils on terraces, formed in alluvium. The surface layer is dark brown silt loam about 6 inches thick. The sub-surface soil is over 40 inches thick and is dark brown and dark grayish-brown silty clay loam and silty clay with distinct yellowish-brown and grayish-brown mottles.

Klickitat soils are deep, well-drained, gently sloping to extremely steep soils formed in alluvial and colluvial materials derived from basalt. They are found on Coast Range sites at elevations of 500 to 4000 feet. Typically the surface layer is a dark reddish-brown gravelly clay loam about 8 inches thick. The sub-surface soil is a reddish-brown very gravelly clay loam about 20 inches thick grading to a sub-soil of dark-brown very gravelly loam about 18 inches thick. Fractured basalt is at a depth of about 45 inches.

Marty soils are deep, well-drained, soils that developed in colluvium weathered from coarse grained, intrusive igneous rocks. They are found on nearly flat to 60 percent sloped mountainous upland Coast Range sites at elevations from 800 to 3000 feet. Typically, the surface soil is a dark reddish-brown gravelly loam about 16 inches thick. The sub-surface soil is a dark reddish-brown, reddish-brown, and yellowish-red clay loam and loam extending to a depth of 60 inches or more.

Preacher soils are deep, well-drained, nearly level to steep soils formed in alluvial and colluvial materials derived from sandstone. They are found on Coast Range sites at elevations of 250 to 2500 feet. Typically the surface layer is a very dark brown and dark brown clay loam about 14 inches thick. The subsoil is dark yellowish-brown clay loam about 28 inches thick. Pebbles make up about 10 percent of this layer. The underlying material is yellowish-brown sandy loam about 18 inches thick. Weathered sandstone is at a depth of about 60 inches.

Slopes on the majority of the sites varies from flat to 35 percent. Soils on this proposed project area are stable with moderately high to high productivity. Vegetation re-establishes fairly rapidly following disturbance.

There are two management concerns with these soils: the potential for compaction and the potential for surface erosion. Due to the substantial amount of clay and silt size particles in these soils, they easily compact when moist or wet and subjected to pressure from heavy equipment, dragging logs etc. Once compacted, fine textured soils are very slow to recover as is evidenced by the existing compaction on site, dating to the 1950's. Compaction of the soil can reduce site productivity by limiting/restricting root growth in the compacted soil as well as limiting movement of O₂, CO₂ and H₂O into, out of and within the soil. Depending on the extent and degree of compaction, some reduction of site productivity can be expected. In addition to reduced site productivity, on compacted sloping sites, a reduced water infiltration rate can result in higher rates of surface water accumulation and run off. On bare soil the hazard of erosion can be high. Minimizing compaction of soils in the project area and maintaining vegetation and litter on the soil surface would be a high priority, especially on the steeper areas or long continuous slopes. Since most of the proposed project site has slopes less than 35 percent and most vegetation would remain, the risk of surface erosion is expected to be minimal. The major soils concern for this project is the potential reduction of site productivity due to compaction.

Fuels

There is a moderate accumulation of dead woody material on the ground. Small snags are scattered through the stand. Large snags (over 20 inches diameter) are less than 2 per acre. Based on visual estimates, the estimated total dead fuel loading for these stands is in the 10-20 tons per acre range.

The sale area is located outside the Oregon Smoke Management designated area. These areas are designated as areas where the amount of particulate matter from smoke below 3000 feet altitude is restricted on a daily basis. The sale area is located approximately 9 air miles from the designated area.

Soils/Fuels: Environmental Consequences

Alternative 1 (Proposed Action)

Soils

New impacts to soils and fuels from renovating roads would be minimal since these areas have already been developed in the past and the compacted surfaces already exist. Some vegetation would be cleared and scattered along the right-of-ways and this would add minimally to the slash that would be created when the project area is treated.

Impacts would vary depending on whether harvester/forwarder system or crawler tractors are used, how dry the soils are when heavy equipment operates on them and how deep the soils are covered with slash in the yarding roads. Impacts also include the additional area used for landings. For many of the landings, equipment would operate on existing haul roads or the harvest roads and the additional ground would simply be used to deck logs until transport.

If harvester/forwarder system is used for the entire project, the percentage of total area impacted by surface disturbance and soil compaction as a result of: landing construction would be approximately 1 percent (approximately 2.7 acres); from harvester/forwarder yarding roads approximately 2 percent to 8 percent (approximately 5-18 acres). Total percent area affected: approximately 3 percent to 9 percent. Very little or no top soil loss would occur.

If yarding is done using crawler tractors for the entire project, the percentage of total unit area impacted by surface disturbance and soil compaction as a result of: landing construction would be approximately 2 percent (approximately 5 acres); from tractor yarding roads approximately 7 percent to 8 percent (approximately 16-19 acres). Total percent area affected: approximately 9 percent to 10 percent. Expect a small amount of top soil loss (displacement) to occur in yarding roads and at landings.

Some of the potentially impacted acreage listed above, includes already existing, compacted skid roads from previous logging in the 1950's. These existing roads would be used as much as practical when marking locations for harvest roads for this project. As a result, the acreage of new or additional harvest impacts would be less than the totals listed above, while the total area of impacted ground is expected to be within the total ranges listed.

For harvester/forwarder systems, soil impacts in harvest roads are expected to result in light to moderate compaction in two discontinuous, narrow strips less than 3 feet in width. The trees in the project area have ample crowns, so there should be adequate slash on the ground to yard over. The affect on overall site productivity from light to moderate compaction on less than 9 percent of the total area is expected to be low (probably less than 2-3 percent reduction in yield).

For tractor yarding soil impacts are expected to result in moderate, fairly continuous compaction within the landing areas and the main 8-10 foot wide yarding roads. Impacts would be light to moderate on less traveled portions of yarding roads. The affect on overall site productivity from mostly moderate compaction on 10 percent of the total area is expected to be less than 4 percent reduction in yield.

The severity of compaction can be mitigated when slash and small logs are left in the skid roads and the total number of passes is low (less than 10). With tractor skidding it is much harder to keep slash and debris on the skid roads for more than a few passes, so additional effort would be needed to replace slash and debris back onto skid roads. Operating only when soils are dry and soil strength is high would help to reduce the amount of crushing of individual soil aggregates and resulting compaction. Multiple passes on moist or wet soil usually results in heavy compaction.

Fuels

The increase in slash created by the proposed thinning would result in a risk of higher fire intensity on the thinned sites following logging. The dead fuel loading is expected to be increased by 5 to 15 tons per acre with a discontinuous arrangement. Total dead fuel loadings would range from approximately 15 to 35 tons per acre. The fuel model would shift from Model 8 to model 10/11. Overall, the risk of fire following this action would be moderate. This is due to the moderate to flat topography, the continued existence of a tree canopy shading the fuels (cooler temperatures, higher humidity), and the fact that access roads to much of the treated area would be blocked via gates, berms, ripping etc.

Risk of fire would be greatest during the period when attached needles dry out the first season following cutting. These "red needles" generally fall off within one year and fire risk greatly diminishes. Fire risk would continue to diminish as the area "greens up" with understory vegetation, and the fine twigs and branches in the slash begin to break down. In order to mitigate fire risk these sites should be monitored for the need of closing or restricting access during periods of high fire danger. During the closed fire season the first year following harvest activities, while fuels are in the "red needle" stage, the entire area should be posted closed to all off road motor vehicle use. Burning of landing piles and slash concentrations along roads would reduce risk of a fire start from human ignition sources.

Burning would be done in the fall under good atmospheric mixing conditions when the threat of impacting air quality in designated areas would be very low. Any residual smoke should be of short duration and occur during a period of the year when there is less outdoor activity, generally good mixing and an increasing likelihood of rain storms that would scour the air shed and extinguish residual fire.

Alternative 2 (No Action)

No action would result in the continuation of current conditions at this site (i.e., timber stand and brush would continue growing). Existing soil compaction would decrease slowly through natural processes.

E. WATER/RIPARIAN

Issue: Effects on stream flow, channel conditions, water quality and aquatic conservation strategy objectives.

Water/Riparian: Affected Environment

The primary stream draining the project area is the South Fork Alsea River. The project area is contained in the upper South Fork Alsea watershed which is approximately 12,000 acres or 14.8 square miles in drainage area. Several South Fork Alsea tributaries, including Coleman Creek, Williams Creek and Fall Creek drain the area.

The upper South Fork Alsea, which begins just upstream from the Alsea Falls, is morphologically distinct from the lower South Fork Alsea. The river lies in a broad, low gradient bowl-shaped valley whose peaks and ridges are capped by resistant intrusive rocks. Low channel gradient is controlled at a “nick point” formed by resistant bed rock at Alsea Falls and this has induced valley filling upstream.

The upper South Fork Alsea main channel (from Alsea Falls to the confluence with Williams Creek) is primarily a Rosgen F stream type: less than 1 percent gradient, with high entrenchment and width/depth ratios and low sinuosity (Rosgen, 1996). It appears to have poor bank stability and moderate to high levels of bank erosion in portions, particularly below the confluence with Williams Creek.

The main tributary channels in the area (Coleman Creek, Fall Creek, Williams Creek, etc.) are moderately incised, 2 to 4 percent gradient, gravel/cobble bedded channels. These channel types are fairly resistant and functional. However, they transition to highly incised channels with high width to depth ratios and moderately high levels of bank erosion as they near their confluence with the main South Fork Alsea channel.

Small tributary channels in the project area range from headwater ephemeral channels in the uplands to deeply incised gullies on the valley floor and flats. Due to the small size substrate in the bed and banks of these channels they rely upon vegetation to maintain stability. Fortunately, the nearly constant temperate and humid conditions in the coast range provide for heavy vegetation growth and most of these channels appear to be fairly stable and in functional condition.

In addition to the natural channels in the project area there are two man made drainage ditches, both constructed by back hoe in the 1960s. Both ditches drain flat wet areas with high water tables to the mainstem South Fork Alsea. Ditches were constructed in the hope of improving soil moisture conditions for Douglas-fir in the area by lowering water tables which had risen following extensive clearcutting in the late 1950s. Both ditches are vegetatively stabilized gullies for most of their lengths although they cut deeply into

adjacent soils and exhibit bank erosion and head cutting near their confluence with the South Fork. Ditch 1 appears to be maintaining itself and almost functions like a natural channel while Ditch 2 appears to be filling in and would likely revert to its pre-disturbance condition over time.

Although no historic reference concerning the trapping of beaver (*Castor canadensis*) and removal of beaver dams (further reducing channel resistance elements) was located for this watershed, it was a common practice throughout the last century and is likely to have influenced channel conditions here. Much of this disturbance coincided with two of the largest flood events of the last century which occurred in 1955 and 1964. The result has been an increased rate of channel incision into its alluvial bed followed by lateral scour, channel widening and increased bank erosion. This was followed by four decades of reduced inputs of large woody debris, increases in sediment supply and ditch construction in some areas to further increase drainage efficiency in the watershed.

Comparisons of main channel fish habitat inventories from 1986 to 1996 (following the 1996 flood event) indicate small changes in channel conditions but the overall trend appears to be maintenance of the status quo. There remains a strong beaver influence throughout the area, particularly reaches upstream from Williams Creek (also the reaches with the best habitat and greatest concentration of large wood). While a small increase in shading, pool numbers, large wood and retention of substrate appears to have occurred in the first reach above Alsea Falls, this was due to recruitment from the next reach upstream which has shown a comparable decline in each of these parameters.

Water Quality and Beneficial Uses

Little quantitative data concerning suspended sediment transport and/or turbidity is currently available for this watershed. The data that has been collected implies that fine sediment levels in stream substrates and those transported as suspended sediment during winter storm events are within the range of natural variability for this watershed. It should be noted that the upper South Fork Alsea watershed has large stretches of low gradient, alluvial channel with active beaver populations. These conditions are conducive to the capture, storage and transport, particularly during storm events, of high concentrations of fine sediment.

Although data indicate that fine sediment supply and transport are within the range of natural variability in this watershed, sampling to date has been infrequent. Currently there is not enough sediment data in the watershed to provide a detailed representation of water quality conditions. In addition, other observations of channel and hillslope conditions suggest that fine sediment supply and transport in the watershed may be high. In response to these concerns, physical and biological monitoring in the upper South Fork Alsea channel is ongoing.

Stream Temperature

Continuous stream temperature measurements were collected at several sites on the upper South Fork Alsea main channel as well as on lower Coleman Creek, an unnamed tributary, Fall Creek, and Williams Creek in the summers of 1999 and 2000 (methods from the Water Quality Monitoring Guide Book, Version 1.03, from the Oregon Plan for Salmon and Watersheds).

In the South Fork Alsea main channel, stream temperatures were above the state standard of 17.8° C at all of monitoring sites for several days during both years. Due to the simplified and widened main channel on the upper South Fork Alsea, riparian vegetation is less effective at providing shade. In addition, portions of the upper main channel flow through open meadow settings and are exposed to direct sunlight for much of the day during summer. Stream temperature may also be above standards in response to extensive beaver dam pools scattered throughout the main stem. However, temperatures showed a cooling trend between the site highest in the watershed at river mile 15 and the lower site near Fall Creek near the Alsea Falls recreation area. Evidently, tributary channels such as Coleman Creek and Fall Creek, which maintained summer stream temperatures well below the state standard in both years, are cooling the main stem of the South Fork Alsea in the project area. Of the four tributaries monitored in the project area, only Williams Creek exceeded the state standard for several days in July of 2000.

Based on field and aerial photo observation, current stream side vegetation on tributary channels in this area is likely adequate to shade surface waters during summer base flow. These observations are corroborated by the summer stream temperature data collected in 1999-2000 (they are well within the range of natural variability for mid-coast Oregon). The exception to this is Williams Creek where an unusually large beaver pond low in the watershed has produced a large canopy opening with full exposure to solar radiation during the summer. This pond (on private land) provides excellent aquatic habitat but is probably contributing to higher stream temperatures in Williams Creek. Continued implementation of the Northwest Forest Plan would likely maintain the current stream temperature regime on public lands in the watershed (or possibly lead to further cooling along the main channel).

Oregon Department of Environmental Quality's (DEQ) *1998 303d List of Water Quality Limited Streams* is a compilation of streams which do not meet the state's water quality standards. Neither the South Fork Alsea or its tributaries are listed in the report. However, the Alsea River is listed as not meeting water quality standards for summer stream temperatures from the mouth to headwaters.

The DEQ has also published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (*1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution*). The upper South Fork Alsea and its tributaries were identified as either having no problem or lacking data (the report does not discriminate between no problem and no data).

Beneficial uses of surface water from the project area are displayed in the table which follows. There are no known municipal or domestic water users in the project area. Irrigation and livestock watering occur in the Alsea valley near the town of Alsea, approximately 5 miles downstream from the project area. Additional beneficial uses of the stream-flow in the project area include resident fish, recreation, and esthetic values.

Table 5

BENEFICIAL USES ASSOCIATED WITH STREAMS IN THE PROJECT AREA

Stream (Watershed)	Project Action	Beneficial Use	Distance from Project Action	Information Source
South Fork Alsea	Thinning in riparian reserves	Anadromous fish	1 mile (below falls)	BLM
		Resident fish	Immediate	BLM
	Road reconstruction.	Domestic use	greater than 10 mile	WRIS*
		Irrigation/live-stock watering	5 miles	WRIS*

* WRIS = *Water Rights Information System* of the Oregon Department of Water Resources

Riparian Reserve Widths

Riparian Reserves in the proposed project would be 420 feet on each side of perennial fish-bearing streams and 210 feet on each side of intermittent and perennial non-fish bearing streams. These widths are in conformance with the *RMP* (p.10). Within these Riparian Reserves, stands would be thinned to densities ranging from 76 to 103 trees per acre. The actual stream protection area along streams would be excluded from treatment. See Appendix F for criteria used to identify stream protection areas.

Water/Riparian: Environmental Consequences

Alternative 1 (Proposed Action)

Measurable effects to streamflow, channel morphology, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows.

This proposal is unlikely to substantially alter stream flow or peak flow events. Tree removal and road renovation would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts resulting from tree harvest and road renovation would be mitigated and, with the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams. Although thinned, substantial portions of the riparian canopy would be retained therefore maintaining riparian microclimate conditions and protecting streams from increases in temperature.

In conclusion, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). Over the long term this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in the riparian zone.

Streamflow

Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation, as a consequence of the mechanical removal of trees and reductions in stand density, has been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the upper South Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed.

Water Quality

Sediment Delivery to Streams and Turbidity

Two natural erosion processes, mass wasting and surface erosion, are the primary sources for sediment delivery to streams. Mass wasting in this watershed is generally limited to hillslopes with gradients steeper than 60 percent (SFAWA). Management on steep slopes may accelerate mass wasting processes. Surface erosion processes in the Oregon coast range are nearly non-existent on forested land due to the high infiltration capacity of native soils, heavy vegetative growth and deep layers of surface organic material (“duff”). However, practices that compact the soil surface, remove the “duff layer” or concentrate runoff may lead to surface erosion with the potential for delivery to streams and a degradation of water quality. In both cases, management practices with the potential to accelerate erosion fall into three categories: road construction, timber harvest, and site preparation. Best management practices (BMPs) and mitigation measures are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area.

Stream Protection Areas

For the protection of stream channels and aquatic resources, “stream protection areas” were applied to all stream channels in the project area. These buffers were determined in the field by BLM personnel following a protocol developed by the area hydrologist, biologists and riparian ecologist. The protocol required a minimum twenty-five foot stream protection area adjacent to the streams in the project area (minimum fifty foot stream protection area would be required adjacent to the mainstem of the South Fork Alsea River). This buffer could be extended upslope, during field surveys, as far as deemed necessary to protect aquatic resources. This determination was based on site features such as floodplains, slope breaks, slope stability, water tables, etc.. Additionally, no-treatments in riparian areas are proposed unless stand densities and composition clearly indicate the need. Hence, large areas of riparian vegetation were excluded from treatment under this proposal (e.g., the riparian zone along portions of the main South Fork channel).

Road Renovation and Hauling

The risk of impacts to water quality due to road renovation would be limited by restricting work to periods of low rainfall and runoff. Renovation would employ techniques to reduce concentration of runoff and sedimentation to a minimum, such as water-bars on steeper sections of road.

The main haul routes would be on rocky forest roads to the Alsea Access Road which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches were large enough to enter streams. However, harvest and hauling under this proposal would be limited to periods of low moisture.

Tree Harvest and Yarding

Yarding corridors, if sufficiently compacted, may route surface water and sediment into streams. However, several factors limit the potential for this to occur: 1) even if compacted, high levels of residual slash on yarding corridors would contribute to reducing the accumulation of runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil; 2) gentle gradients in this project area provide little opportunity for surface water to flow; 3) stream protection area in riparian areas have high surface roughness which functions to trap any overland flow and sediment before reaching streams; 4) the small size of trees being yarded would limit surface disturbance to minimal levels; and 5) yarding would occur during periods of low soil moisture with little or no rainfall.

Tree removal is not proposed on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action.

Stream Temperature

Shading along all the tributaries in the project area is currently adequate, and this proposal would not substantially alter stream side shading here. Forest density and hence shading immediately adjacent to the mainstem South Fork Alsea would be left virtually unaltered under this proposal. Riparian stream protection area were specifically placed to protect portions of the mainstem channel where forest shade is critical to maintenance of the current stream temperature regime. Overall, this proposal is unlikely to have any measurable effect on stream temperatures in this watershed. The SFAWA (Map 9) indicates low stream temperature risk for the project area.

Reductions in stream temperatures would probably not occur on the main channel without improvements in channel morphology (i.e., deeper, narrower channel with increased numbers of wood jams, wood cover and deep pools) in some reaches and recovery of older forest characteristics (i.e., multiple canopies, mixed deciduous and conifer) along the banks and adjacent river terraces. However, in response to the high concentration of low gradient, open channel reaches in this watershed it is likely that ambient summer stream temperatures have always been higher relative to other coast range streams.

Additional water quality parameters (e.g., nutrients, dissolved oxygen, pesticide and herbicide residues, etc.) are unlikely to be affected by this proposal and were not reviewed for this analysis (U.S.E.P.A., 1991).

Channel Stability and Function

The minimization of potential disturbances from the proposed project is likely to result in

the maintenance of stream channels in their current condition. Some channels in the project area are currently functioning at the low end of the range expected under “reference conditions.” Other channels are functioning normally. In the short term, this proposal is unlikely to alter the current condition of channels in the project area for several reasons; 1) there would be no activities directly in channels, or on streambanks or floodplains; 2) streamflows and sediment delivery are unlikely to be altered; and 3) the stream’s supply of large wood would not be altered.

Over the long term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western red cedar, which are currently suppressed. In the upper South Fork Alsea River large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat.

Ditch 1 and 2

The placement of additional obstructions and material into Ditch 1 would increase channel resistance leading to reduced flow and greater deposition in channel. Overtime this may help the channel to fill-in and return the area to pre-disturbance conditions.

Ditch 2 is currently filling with debris and sediment naturally. No additional actions are needed to recover over time to meet pre-disturbance conditions in the area around Ditch 2.

Cumulative Effects

In almost all cases, removal of more than 20 percent of the vegetative cover over an entire watershed would result in increases in mean annual yield (Bosch, 1982). Removal of less than 20 percent of vegetative cover has resulted in negligible changes where it was not possible to detect any effect. Typically, increases in stream flow occur during periods of low soil moisture and are attributed to reductions in evapo-transpiration.

In addition to alterations in mean annual water yield, alterations in the timing and/or quantity of peak flow events as a result of forest harvest and road construction have been studied for several decades. Jones and Grant (1996) hypothesized that clear-cutting leads to increases in stormflow volume while road construction and wood removal from channels results in earlier, higher peak flows. Alterations in peak flow timing and quantity are particularly of concern in watersheds with potential for snow accumulation and quick melt-off during rain-on-snow events (ROS) such as occurred in the 1996 flood.

A “Level 1” analysis of the risk for cumulative effects to hydrologic processes, channel conditions and water quality for the upper South Fork Alsea watershed was conducted utilizing the *Salem District Watershed Cumulative Effects Analysis Procedure, FY1994*. The following conditions were observed:

* The upper South Fork Alsea covers approximately 12,000 acres of which 3,500 (30 percent) are private land while the remaining 8,500 (70 percent) are managed by the BLM.

460 acres (2 percent) of the upper South Fork Alsea watershed is “open” (consisting primarily of recent clear-cuts less than 10 years in age) while closed stands of conifer and deciduous species covers 11,540 acres (98 percent) of the watershed.

* Most of the private forest stands in the watershed are old enough to be thinned or clear-cut harvested (greater than 40 years in age) within the next 10 years. Approximately 400 acres of public land is available for regeneration harvest within the next 10 years; 3,500 acres are available for commercial thinning or stand density management (in LSRs and riparian areas).

* The transient snow zone (TSZ) comprises approximately 40 percent (4800 acres) of the watershed.

* There are approximately 104 miles of road for a road density of 5.5 miles/mi². One-hundred twenty stream crossings potentially results in a stream extension of 12 miles (10 percent increase in channel lengths) during large storm flow events.

The Level 1 analysis indicates that, when past activities together with likely near term management activities are considered, a moderate risk level for cumulative effects to water quality, channel conditions and hydrologic conditions in the upper South Fork Alsea exists. As a result, a more intensive analysis was conducted to further define risk levels.

Level 1 and level 2 analyses for increases in peak flow and risks to aquatic resources was conducted using the Washington State DNR watershed analysis methods (Washington Forest Practice Board 1997). Details of the analysis are contained in a supplemental report (*Cumulative Effects Analysis for the Upper South Fork Alsea Watershed*).

In summary, the analysis found a low sensitivity to increases in peak flows and low potential risks for aquatic resources for normal storm events. It found an “indeterminate” risk for “unusual” peak flow events associated with a 2-yr return interval. This lead to a level 2 analysis to provide greater precision. The level 2 analysis (Bed Mobility Analysis) indicated a “low” risk for effects to channel substrate as a result of the worst scenario estimated in the level 1 analysis. Therefore, it was concluded that potential cumulative effects leading to increases in peak flows, under this proposal in conjunction with other likely actions in the watershed, are low.

Table 6 is a summary of the potential cumulative effects (CE) to watershed and aquatic resources that are expected under this proposal in combination with past actions and likely future actions on private lands in the watershed.

Table 6. Upper South Fork Alsea: Current Condition and Cumulative Effects Trends for Watershed and Aquatic Resources.

ATTRIBUTE	Current Condition (2000)	Projected activities on public lands (through 2010)	Projected activities on private lands (through 2010)	Combined public and private (through 2010)
WAR Rating ¹	Low	Indeterminate	Low	Indeterminate
Bed Mobility ²	Low	Low	Low	Low
Coarse Sediment Supply ³	High in tributaries, low in main channel and from hillslopes	Shortterm: no change Longterm: increased main channel retention	Small increase	Small short term increase
Fine Sediment Supply ⁴	High in-channel storage; roads (unknown)	Shortterm: slight increase Longterm: increased main channel retention	Small increase due to logging activity	Small increase over the next decade due to logging activity/road use
Riparian large wood recruitment potential ⁵	Moderate to poor	Shortterm: no change Longterm: increased potential	Decrease	Increase: bulk of riparian is on public where LW potential is increasing
Road Density	5.5 m/sq-m	Slight decrease	Increase	Increase as forest management increases
Aquatic habitat: Pools/cover ⁶	Good to fair in tributaries, poor in lower mainstem	Shortterm: no change Longterm: improvements	Slight reduction in pool depth/quality	Maintain or increase pool quality and depth
Water quality: stream temperature ⁷	Meets state standards in tributaries, below standard in lower mainstem	Shortterm: no change Longterm: improvements	Shortterm: no change Longterm: improvements	Shortterm: no change Longterm: improvements

WAR Rating¹- preliminary analysis based on Washington State DNR watershed assessment methods, from hydrologic conditions module (Washington Forest Practice Board. 1997). WAR (water available for runoff) estimates the percentage increase in WAR during a large rain-on-snow event (i.e., 1996 event) relative to a fully mature canopy. less than 10 percent increase results in a sensitivity rating of LOW while a greater than 10 percent increase is indeterminate and requires a level 2 analysis.

Bed Mobility² - a level 2 analysis for watersheds with indeterminate sensitivity ratings from the Washington State DNR watershed assessment methods. Estimates the probability of bed scour assuming increases in peak flows calculated in WAR. Ratings are LOW, MODERATE or HIGH.

Coarse sediment supply³ - supply of sediment greater than 2mm (gravel, cobble, boulder) to stream channels. From SF Alsea WSA, aerial photo review, and field review. Likely sources are mass wasting from steep hillslopes and storage in alluvial terraces and in-channel.

Fine sediment supply⁴ - supply of sediment less than 2mm (sands and silts) to stream channels. From SF Alsea WSA, aerial photo review, and field review. Likely sources are storage sites in terraces and channels (bank erosion), road surfaces, and upland erosion (mass wasting and overland flow).

Riparian large wood recruitment potential ⁵ - Potential for large wood (greater than 24 inches dbh) to enter stream channels from adjacent riparian. From SF Alsea WSA, habitat surveys and field review. Assumes increased recruitment over the long term (50 years plus) on public lands under the current forest plan with decreased potential on private lands under current forest practice regulations.

Aquatic habitat: pools/cover ⁶ - From SF Alsea WSA, ODFW habitat surveys and field review. Assumes increased large wood recruitment on public lands would lead to improved pool quantity and quality.

Water quality ⁷ - From SF Alsea WSA and field data (BLM). Assumes increased shading on public lands would lead to reductions in stream temperatures.

The risk of this proposal for contributing to cumulative effects to hydrologic processes or water quality in these watersheds is low. To the extent that this proposal would influence overall watershed condition, it potentially could result in short term, local increases in stream turbidity in the winter following road renovation and closure and it would likely contribute to an increase in the supply of large wood to channels. Since LWD and pool habitat are “at risk” in these streams (SFAWA) long-term LWD supply to streams is likely the most critical factor for maintenance of aquatic habitat in these watersheds. This proposal would likely improve LWD supply.

Alternative 2, No Action

No action would result in the continuation of current conditions and trends at this site as described in the Description of the Affected Resource section of this report and in the SFAWA.

Riparian: Environmental Consequences

Alternative 1, (Proposed Action)

The prescription for the uplands portion of the stands would be appropriate for the Riparian Reserves since it would also accomplish the goals identified for the Riparian Reserves. The goal of growing large trees more quickly and maintaining crown ratios can be achieved with a generally evenly spaced thinning. Some variable spacing would be accomplished by marking extra trees to cut in areas with a developing understory, or near trees with “wolfy” characteristics. In addition, extra leave trees would be marked next to existing snags, creating small clumps of trees. Later when the uplands are regeneration harvested, emphasis in the Riparian Reserves would be to release conifer understory, create large diameter CWD and snags, and enhance variable spacing.

Development of desired stand characteristics would be accelerated in the following ways:

- **Restored structural complexity of the stands:** The proposed action would increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid canopy and ground levels. It is expected that understory initiation of shade tolerant conifers associated with canopy layering would be promoted in areas of increased light over the long term. In the short term a more complex understory would develop, consisting of more shrub species. Within conifer release areas the survival and growth of the existing conifers would increase providing a wider variety of species diversity. Relative density (RD in the

tables) is an indicator of mortality from competition. RD in all units is lowered to less than .44 by density management, and remains relatively low 50 years later. A lower RD indicates a higher chance for understory development. Relative densities in all units are lower for treated stands 45 years in the future.

- **Accelerated development of desired tree characteristics:** Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average DBH, and larger crowns (higher crown ratios) at any given age, compared to the no treatment option. As Table 7 indicates, diameters 45 years in the future in the treated stands would range from 13 to 27 percent larger. Crown ratios, which are indicators of wind firmness and crown depth would range from 4 to 30 percent higher.

Table 7

Comparison of Treatment vs. No Treatment 45 years in the future¹

Unit	Treatment	Age	DBH ²		Conifers/ Ac	BA	RD ³	Crown Ratio	Cum. Mortality trees/Acre ⁴	Av. Snag/CW DBH
1	Proposed Treatment Thin to BA 110. DF only	39	DF 15.2	GF 11.7	95	110	0.35	.43		
	No Treatment	84	DF 18.0	GF 16.0	164	311	0.87	.26	31.1	11.0
	With Treatment	84	DF 24.5	GF 17.3	91	250	0.66	.28	7.5	13.9
2	Proposed Treatment: thin to BA 100. DF only	47	DF 16.0	WH 10.4	87	100	0.34	.34		
	No Treatment	92	DF 18.0	WH 20.5	155	304	0.84	.18	119.6	8.6
	With Treatment	92	DF 24.8	WH 18.2	70	211	0.54	.24	11.1	11.2
3	Proposed Treatment: thin to BA 110. DF only	34	16.1		77	110	0.32	.53		
	No Treatment	79	21.8		114	319	0.82	.22	52.5	9.4
	With Treatment	79	26.4		74	286	0.68	.26	6.0	18.4
4a	Proposed Treatment: Thin to BA 80	33	11.7		103	80	0.34	.51		

Unit	Treatment	Age	DBH ²		Conifers/ Ac	BA	RD ³	Crown Ratio	Cum. Mortality trees/Acre ⁴	Av. Snag/CW DBH
	No Treatment	78	17.6		136	284	0.81	.27	19.7	11.6
	With Treatment	78	20.3		97	261	0.72	.28	9.3	13.2
4b	Proposed Treatment: Thin to BA 110. DF only	38	DF 15.9	WH 11.2	89	110	0.34	.41		
	No Treatment	83	DF 18.7	WH 18.0	143	299	0.82	.19	145.8	7.8
	With Treatment	83	DF 24.3	WH 20.0	84	254	0.65	.22	8.0	16.6
4c	Proposed Treatment: Thin to BA 110. DF only	47	DF 16.3	WH 10.4	87	110	0.34	.34		
	No Treatment	92	DF 18.0	WH 20.5	155	304	0.84	.18	119.6	8.6
	With Treatment	92	DF 24.2	WH 17.9	77	225	0.58	.22	12.4	11.3
5	Proposed Treatment: Thin to BA110. DF only	36	DF 15.2	GF 15.5	83	110	0.33	.42		
	No Treatment	81	20.8		139	368	0.95	.18	164.4	9.8
	With Treatment	81	27.1		79	333	0.78	.22	7.3	17.8
6	Proposed Treatment: Thin to BA 150	45	16.9		85	150	.35	.43		
	No Treatment	80	23.6		118	359	.74	.46	14	NA
6	With Treatment	80	26.0		77	285	.56	.54	6	
7	Proposed Treatment: Thin to BA 150	45	12.5		99	150	.37	.47		
	No Treatment	80	18.9		180	349	.80	.46	95	NA
	With Treatment	80	22.9		93	265	.55	.54	6	NA

Unit	Treatment	Age	DBH ²		Conifers/ Ac	BA	RD ³	Crown Ratio	Cum. Mortality trees/Acre ⁴	Av. Snag/CW DBH
8	Proposed Treatment: Thin to BA 140. DF & WH	50	DF 16.7	WH 15.1	93	140	0.42	.36		
	No Treatment	95	DF 18.6	WH 15.4	147	273	0.76	.19	80.7	10.3
	With Treatment	95	DF 23.0	WH 18.7	87	236	0.61	.23	9.1	16.0
9	Proposed Treatment: Thin to BA100	34	13.5		98	100	0.31	.44		
	No Treatment	79	16.8		164	277	0.78	.19	144.8	8.3
	With Treatment	79	21.7		92	243	0.63	.23	9.5	15.2
10, 11	Proposed Treatment: Thin to BA130. DF & WH	45	DF 17.2	WH 18.5	80	130	0.31	.38		
	No Treatment	90	DF 21.1	WH 25.8	129	368	0.78	.42	53	12.0
	With Treatment	90	DF 26.8	WH 27.0	55	227	0.44	.6	14	18.5
12	Proposed Treatment: Thin to BA 120. DF only	51	16.7		76	120	0.34	.44		
	No Treatment	96	18.9		143	302	0.81	.22	65	9.3
	With Treatment	96	24.2		74	243	0.60	.27	5.5	16.0

Unit	Treatment	Age	DBH ²	Conifers/ Ac	BA	RD ³	Crown Ratio	Cum. Mortality trees/Acre ⁴	Av. Snag/CW DBH
<p>NOTES:</p> <ol style="list-style-type: none"> 1. In order to compare results of the proposed treatments versus no treatment, all stands except Unit 10/11 were modeled using ORGANON, SMC v.1.0, a growth and yield model developed by OSU. Unit 10/11 was modeled using SPS v.2.3a, developed by Mason, Bruce & Girard, Inc. Numbers generated by growth and yield models can be used as a relative comparison of treatments in a given stand, but are not necessarily accurate predictions of future growth. Future stand measurements are dependent on disturbance patterns and other stochastic events which can never be accurately predicted. 2. Douglas-fir DBHs increase while understory grand fir and western hemlock diameters vary from a 13 percent decrease to an 18 percent increase. Decreases are likely due to diameter distributions and assumptions made by the model. 3. RD (relative density) is a ratio: trees per acre in a stand adjusted to a 10 inch diameter, divided by the number of trees per acre in a fully stocked stand 10 inches in diameter (595 for DF). 0.35 RD is the point where growth slows from competition. 0.6 RD is a point where competition begins to cause mortality. 4. Includes trees reserved for future sang/CWD creation and assumes they would equal or exceed the average stand diameter. 									

Opening up the canopy may cause such ground level micro climatic changes as increased light levels, increased temperatures, higher humidity and increased wind speed. These effects vary depending on aspect, slope and vegetation removed and are difficult to quantify. Preliminary data from some studies show that these effects are generally limited to the first 50 to 75 feet from a stream. It is expected that most of these effects would be mitigated by the stream protection zone, and that those that do occur would be of short duration and would be ameliorated as crowns close and brush covers the ground.

There would be a short term elevated risk of Douglas-fir bark beetle infestation in healthy standing trees, due to unyarded cut trees, windthrow, and logging damage to residual trees. Bark beetle infestation risk may be minimized by following guidelines developed for the Siuslaw National Forest. A summary of those guidelines is attached (Appendix B-2).

Alternative 2 (No Action)

The canopy would remain closed, allowing little light to penetrate to the ground. The relative density (RD) of the stands as predicted by the models, would be over 0.7 if left untreated for 45 years (Table 3). An RD of 0.6 is considered the point where mortality due to competition begins. Therefore it can be concluded that no significant understory would develop within the next 45 years and beyond without density management.

Natural disturbance would be the agent for creation of stand structural diversity. The most likely agent for this disturbance would be wind, which would create openings in patches. It is unknown how long it would take for natural disturbance to create the structural and species diversity needed in this watershed, but it is expected, based on experience and a considerable body of research, that this diversity would take considerably longer to develop than if the proposed action were implemented.

All special attention species would be protected, and noxious weed populations in the area would remain low.

F. WILDLIFE/FISHERIES

Issue: Effects on special status, special attention and other wildlife species and their habitats. Effects on fisheries and their habitats.

Wildlife: Affected Environment

A summary of forest habitat conditions presented in the *SFAWA* (USDI-BLM 1995; covers south half of Upper Alsea Watershed) shows that 17,360 acres (43 percent) of the South Fork Alsea Watershed is composed of early to mid-seral habitats. About 8,300 acres of this habitat lies on BLM land (37 percent of 22,500 acres). The forest stands on BLM lands within 1 mile of the proposed treatment units (5572 acres) are composed primarily of early- to mid-seral conifer and mixed conifer/hardwoods (76.4 percent, 4256 acres), with a several regenerating clear-cuts (3.7 percent, 205 acres), and scattered mature (7.0 percent, 390 acres) and old-growth patches (10.4 percent, 580 acres). The private lands within 1 mile of these proposed units (2550 acres) are composed mostly of early- and mid-seral conifer and hardwood forests (1780 acres) along with some recent clear-cut patches (410 acres). No old-growth forest patches remain on private lands in this vicinity.

The *SFAWA* found that the structural components of forest stands that were of most concern for wildlife habitat within this watershed were: large hard snags, coarse woody debris (CWD), development of sub-canopy layers, and tree species diversity. The project area is composed primarily of moderate to high density Douglas-fir with some adjacent pockets of hardwoods. Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of CWD, and species diversity) are generally lacking in the young stands surrounding and including the project area. The legacy of previous harvests in these areas has resulted in moderate to high accumulations of large down logs in advanced stages of decay, with very few large snags (dbh greater than 20 inches). A few root rot pockets which have recently developed in a few units, along with windthrow and stem exclusion processes, have recently contributed modest amounts of small diameter snags and down logs. The proposed project area does not contain any significant special habitat features. However, some special habitats (e.g. wetlands and seeps) do exist adjacent to proposed units.

A great variety of wildlife species may use early- and mid-seral conifer dominant forest habitats. Most of these species can utilize a broader range of habitat conditions than those species associated with old-growth or early-seral habitats. The *SFAWA* found that the primary concern for wildlife species within this watershed was the greatly reduced and fragmented condition of the remaining old-growth habitat, only 2,124 acres (5.3 percent of watershed). Whereas, the early- and mid-seral habitats are quite abundant, making up about 43 percent of the current forest habitat in the watershed. About half of the proposed units fall within Riparian Reserves boundaries. However, the habitat conditions previously described for the uplands (outside of Riparian Reserve) are essentially identical to habitat conditions within the Riparian Reserve Boundaries of these units. Actual riparian zone habitat was excluded from treatment boundaries. No roost sites for bats, other than large snags, are known within or adjacent to the project units.

A review of all pertinent Special Status and Special Attention Wildlife Species possibly affected by the proposed action is presented in the Biological Evaluation (see Analysis file).

Many of these species are found in different habitat types or are widespread generalists that are unlikely to be affected by this action. The current status and condition of several of these species was described within the watershed analysis. Only the following species groups warrant discussion concerning their affected environment and environmental consequences related to this proposed action:

- Federally listed wildlife species (species covered by Endangered Species Act)
- Survey and Manage wildlife species (red tree voles and mollusks)
- pertinent bird species (forest raptors, neotropical birds, woodpeckers)
- pertinent mammals (bats, white-footed vole, big game animals)

Federally listed species. In the early 1990's, the northern spotted owl and marbled murrelet were listed as Threatened under the Endangered Species Act, due primarily to the loss of late-seral habitat occurring regionally within their range. No spotted owl surveys were required for this project evaluation. However, extensive survey information is available for this species in the vicinity of the project area. The proposed action lies partly inside of critical habitat that has been designated for spotted owls (CHU OR-48) and for marbled murrelets (OR-03-b). However, no constituent elements of critical habitat for either species would be affected by this action. In the vicinity of the project area, there is one inactive spotted owl site 0.5 miles south of unit 3, and incidental observations of spotted owls since 1993, including a barred owl near Unit 1 in 1999. Use of the proposed units is unlikely by resident owls, however transient owls may disperse through some of these stands. Two individual old growth trees having suitable nesting structure for marbled murrelets (with associated canopy cover) are located within and adjacent to Unit 1. During murrelet surveys in 2000, a single murrelet detection was heard over an old-growth patch north of Unit 1. Additional murrelet surveys would be completed by August 2001. It is very unlikely that murrelets use any part of these proposed units for nesting. Units 1, 2, and 12 lie adjacent to old-growth forest patches that may be occupied by marbled murrelets. No known bald eagle sites exist within 1.0 mile of project area. To address concerns for listed species, consultation was completed with the U.S. Fish and Wildlife Service, under the *Programmatic Biological Assessment of Fiscal Year 2001 Projects in the North Coast Province which would modify the habitats of Bald Eagles, Northern Spotted Owls, or Marbled Murrelets* (August 11, 1999). A final Biological Opinion was received on October 4, 2000. All applicable terms and conditions from the Biological Opinion would be incorporated into the project design features.

Survey and Manage Wildlife Species. Red-tree voles are likely to occupy the adjacent older forest patches and are unlikely to use early- and mid-seral stands within the treatment area due to their young age and small tree size (average dbh less than 16 inches) within stands. Such stand conditions do not require surveys for this species (per IM-OR-2000-037: *Survey and Manage Protocol - Oregon Red Tree Vole, Version 2.0*, dated February 18, 2000). However, Unit 1 was surveyed to protocol due to the presence of two remnant old-growth trees and adjacency to an old-growth patch. No voles were found. The first round of surveys for Survey and Manage (S&M) mollusk species, were completed in Spring of 2000. An additional survey would be completed by May of 2001. No S&M mollusks were found. The design features incorporated into the proposed project, along with any designated Habitat Areas, would provide a high likelihood of maintaining the viability of S&M mollusk species within the local vicinity.

Pertinent bird species. The pertinent bird species likely to occur within the project area include forest raptors, neotropical migratory birds, and several woodpecker species. No surveys are required for these species. The forest raptors such as the goshawk, Cooper's hawk, and sharp-shinned hawk are known to utilize forest stands similar in age and structure to the project area. These species may nest in these stands and forage for birds and small mammals within the forest or adjacent open habitats. Changes in forest structure by harvesting or through natural succession can cause these species to abandon historic nest sites. No known nest sites for these species are known of within or adjacent to proposed units; nor were any active nests found during project planning visits to the area. Goshawks have nested in similar aged stands within 15 miles of these units. Cooper's and sharp-shinned hawks have been observed during the breeding season within the vicinity of the project area. Several species of neotropical migratory songbirds are known to occur and likely nest within the proposed units. Some of these species are believed to be declining regionally due to loss of habitat on their breeding grounds and wintering grounds (Central and South America). Most of these species are insectivorous and make use of a variety of forest habitats. Hardwood stands may be especially important to some species for nest sites and foraging habitat. Several woodpecker species have been observed within and adjacent to the project area. These species which excavate cavities in snags and down logs, may be limited by the distribution and quality of coarse woody material across the landscape.

Pertinent mammals. The pertinent mammals of concern include some bat species, the white-footed vole, and big game species such as deer, elk, and bear. Most of the bat species utilize prominent structural habitats for roosting (buildings, bridges, caves, cliffs, old-growth trees), and then forage over a wide variety of habitats. Only a few bat species are likely to roost among the foliage or bark of mid-seral forest stands, but there are no known structures in the proposed units that support bat roost sites. The white-footed vole is a very rare and relatively unknown small rodent that has been documented within similar forest stands along streams in this watershed. Heavy brush, large CWD, and a prominent hardwood component appear to be important elements of its habitat. Deer and elk use of the project area has been observed during project planning visits to the area. Deer use of the project area appears to be moderate, while very little elk use was noted in any of the units. Black bears are also likely residents within the project vicinity. They often utilize the large clusters of down logs as den sites and, upon emerging in the Spring, may cause some damage to younger Douglas-fir trees as they tear into the bark to feed on the cambium layer. A few old bear-damaged trees were noted during project planning visits, and some existing large CWD may provide adequate denning habitat for this species.

Fisheries: Affected Environment

For the purpose of this analysis, streams have been identified and numbered on the project map and would be referred to as such. The project area contains three major tributaries to the South Fork Alsea River: Coleman Creek, Williams Creek and Fall Creek. Each of these streams provides habitat for cutthroat trout (*Oncorhynchus clarkii*) and have tributaries that run through the units proposed for harvest. Most streams have moderate gradients of approximately 1-4 percent and run through the upper South Fork Alsea valley before entering the South Fork Alsea River. These lower gradient valley streams contain typical small stream pool/riffle habitat with a dominant substrate of gravel. Stream 1 has active beaver dams and provides habitat for cutthroat trout. Stream 2 contains cutthroat trout, but only up a short distance (approximately 50 feet) due to a series of short

steps. Streams 3 and 5 contain cutthroat trout. Stream 7 flows into a swamp before accessing the main stem of the South Fork Alsea, and does not contain fish. Stream 4 is an old man-made ditch that does not contain fish. Stream 8 has fish about 150 feet upstream from the mouth. No barrier was found, however due to the size of the stream, habitat is limited. Streams 9 and 10 do not contain fish.

Alsea Falls (a natural barrier to anadromous fish) is approximately 1/4 mile down stream from the project area.

Listed Fish Species

Coastal Coho Salmon are listed as threatened under the Endangered Species Act. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast Evolutionary Significant Unit (ESU), was submitted to NMFS in March 2001. The BA concluded the proposed project “may affect, but is not likely to adversely affect” Oregon Coast Coho Salmon, Oregon Coast steelhead trout and sea-run cutthroat. The Letter of Concurrence dated April 17, 2001, responding to that BA, concluded the proposed project is not likely to adversely affect Oregon Coast coho salmon and Oregon Coast steelhead.

Wildlife: Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Impacts to Wildlife Habitat. The proposed action and associated activities would change the existing forest structure and alter the development of future forest stand conditions in the treated units. The direct and indirect changes anticipated to occur to forest habitat characteristics are:

[short-term (less than 10 years)]

- light to moderate reduction of canopy closure (resulting canopy greater than 40 percent) over entire treatment area, which represents about 1 percent of the early- and mid-seral forests on BLM lands within the watershed;
- minor reduction and disturbance to existing CWD material (snags and down logs) resulting from felling yarding and road construction;
- creation of new hard CWD of optimal size and quality for available stand conditions;
- retention and enhancement of hardwood tree and shrub diversity on all but 9 acres of the treatment area;

[long-term (greater than 10 years)]

- transition in structural characteristics of the treated stands to more closely resemble late-seral forest habitat (larger diameter trees, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD);
- extended persistence of hardwood tree and shrub cover diversity;
- eventual regeneration harvest of some portion of the treated stands (in GFMA) is likely (subject to future analyses).

While treatment would occur within the Riparian Reserve allocation, no effects are anticipated to occur to riparian zone habitats or to existing remnant older trees and snags within or adjacent to project units. All other activities that are likely to occur in association with this proposed action (e.g. road work, yarding, hauling, prescribed burning, future

firewood contracts) are not expected to alter the structure or suitability of habitats within or adjacent to the proposed units, unless otherwise described below.

Suitable habitat for the federally listed wildlife species (spotted owls and marbled murrelets) would not be affected by this action. Nor would any of the constituent elements of Critical Habitat for these species be affected by this action. Many of the proposed treatment units are very young and densely stocked and do not currently provide dispersal habitat for owls, but would likely provide such habitat after treatment as a result of the increased sub-canopy flying space. Stands that may currently provide dispersal habitat would still function as such after treatment, since the average canopy closure would remain above 40 percent. The proposed harvest action and associated noise disturbance are considered no effect to spotted owls, even if implemented during the critical part of the breeding season (March 1 to July 7); since surveys for this species have not found occupancy within 0.25 miles of any unit during the last three years. The proposed action is considered a "may affect, likely adverse affect" to marbled murrelets if implemented during the critical part of the breeding season (April 1 to August 5), since murrelets may occupy suitable stands adjacent to units 1, 2, and 12 where they may be affected by noise disturbance created by project activities. Since no known bald eagle sites exist within 1.0 mile of project area, this action is considered no effect to this species. The potential impacts to listed species were addressed in formal consultation with the U.S. Fish and Wildlife Service, under the *Programmatic Biological Assessment of Fiscal Year 2001 Projects in the North Coast Province which would modify the habitats of Bald Eagles, Northern Spotted Owls, or Marbled Murrelets* (August 11, 1999). A final Biological Opinion was received on October 4, 2000, which concluded that this action, along with other planned actions for this fiscal year, is not likely to result in jeopardy to these listed species. All applicable terms and conditions from the Biological Opinion would be incorporated into the project design features.

Currently, no Survey and Manage wildlife species are known to occur within the proposed treatment units. The proposed units are not considered suitable habitat for red-tree voles. No surveys for red tree voles were required and no active red-tree vole nests were found on general planning visits to these units. Project activities within these units would have no significant impact on the quality of habitat in the adjacent older forest patch where voles are more likely to be present. All the remaining wildlife species discussed in the affected environment are not likely to be substantially affected by this proposed action, so as to contribute to their decline or elevate their status for concern for the following reasons:

- only a small percentage (less than 1 percent) of the early to mid-seral habitat within the watershed would be affected by this treatment, and locally (within 1 mile), only 6 percent of this habitat on BLM lands would be affected by this action;
- existing habitat in the proposed units would not be lost, but rather it would be retained and continue to provide habitat for the majority of species currently present;
- existing corridors for movement through Riparian Reserves would not be diminished;
- species of concern that may occur within the project area either do not make significant use of this habitat type or their use of this habitat is dependent on structural components (canopy closure, hardwoods, snags and down logs, existing stick nests) that would not be substantially diminished within the local

- landscape;
- and lastly, the resulting CWD creation is likely to improve quality of this habitat component for some species in the immediate future.

Cumulative Impacts. Within the South Fork Alsea Watershed, BLM has commercially thinned less than 200 acres of mid-seral forest stands within the past 10 years (about 1 percent of BLM ownership in watershed). Due to ecological succession and forest management (mostly private land harvests), the amount of habitat in each seral stage within this watershed is not stagnant, but constantly in transition from early open habitats toward mature forest stands. Ecological succession would move about 29 percent of this mid-seral habitat toward late-seral forest conditions on over the next 20 years. Clear-cut harvests on private lands could remove as much as 45 percent of this mid-seral habitat type in the next 20 years. In the near future, BLM (Salem and Eugene Districts) may evaluate commercially thinning and density management of about 1000 acres of early- to mid-seral forests within this watershed. While such thinning harvests do alter forest structure, these treatments do not result in a loss of habitat for most of the species of concern that are known or suspected to use these forests. The cumulative impact on habitat availability for species of concern as a result of past BLM thinning harvests, and foreseeable thinning treatments is considered negligible.

Alternative 2 - (No Action)

This alternative would result in no change to the affected environment. The potential short-term impacts to species as described in Alternative A would be avoided. However, immediate and future gains in forest habitat structure would not be achieved.

Fisheries: Environmental Consequences

Alternative 1 (Proposed Action)

The proposed action would have no measurable adverse impacts to local fish and fish habitat. Habitat and channel conditions are expected to be maintained. Impacts may occur due to small inputs of sediment, but would be short term (a year or less), and would not adversely affect the fish community or stream habitat.

The small amount and size of timber being hauled out in conjunction with stream protection areas, the relatively flat ground in the project area and the seasonal operating restrictions would keep sediment to a minimal level.

Thinning within the Riparian Reserves would enhance stand conditions, growing trees faster than if the stand were to grow naturally (Table 7), which would increase the potential for high quality large woody debris.

Alternative 2 - (No Action)

No action would result in the continuation of current habitat conditions and trends at this site.

G. VISUAL RESOURCES

Issue: Effects on VRM II designated lands.

Visual: Affected Environment

The project area contains land designated as Visual Resource Management (VRM) Class II which is adjacent to the South Fork Backcountry Byway. Visual Resource Management Class II objectives are to retain the existing characters of landscapes. Management activities may be seen but should not attract the attention of the casual observer (pp. 36, RMP) The proposed project boundary is located adjacent to the Byway.

Visual: Environmental Consequences

Alternative 1 (Proposed Action)

Motorists traveling on the South Fork Access Road (backcountry byway) would see small thinned areas immediately adjacent to the byway. Within 5 to 10 years after the completion of harvest operations, the development and growth of understory trees and shrubs would provide a increase in the diversity of stand development along the byway. The proposed action would renovate approximately 4,500 feet of existing roads, which could increase unauthorized off-road vehicle use. The immediate closure of the roads using either a berm and ditch method or piling debris in the roads entrances after the completion of operations would reduce the likelihood of unauthorized off-road use from occurring. Monitoring of unauthorized off-road use would occur by BLM personnel from the nearby Alsea Falls Recreation sites. Harvest operations would not be allowed on the South Fork Access Road.

Alternative 2 - No Action.

Roads to be renovated would remain as overgrown roads. Unauthorized off-road use would not occur.

IV. MONITORING

Monitoring would be accomplished through timber sale contract administration and in accordance with monitoring guidelines in Appendix J of the RMP. Effectiveness monitoring is in process at a slightly older sale (Super Hammer Thinning) which has a similar prescription to this sale. Monitoring of the Gotaway Density Management and Commercial Thinning project could be used to determine the effectiveness of the treatment and to help make recommendations for the timing of future thinning harvests.

V. CONSULTATION

The project area is in the South Fork Alsea River drainage. This watershed has anadromous fish approximately 1/4 mile downstream from the project area. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast ESU was submitted to NMFS in April 2001. The BA concluded the proposed project “may affect, but is not likely to adversely affect” Oregon Coast Coho Salmon, Oregon Coast steelhead trout and sea-run cutthroat. The Letter of Concurrence dated April 17, 2001, responding to that BA, concluded the proposed project is not likely to adversely affect Oregon Coast coho salmon and Oregon Coast steelhead trout. Any decision on the proposed Gotaway Timber Sale Project would be in compliance with the Letter of Concurrence.

The proposed project was submitted for consultation to the U.S. Fish and Wildlife Service (FWS) in August 2000. A final Biological Opinion (# 1-7-00-F-649) on this consultation was received October 4, 2000. The proposed action is considered a “may affect, likely to adversely affect” to marbled murrelets, and “no effect” to spotted owls and bald eagles.

In addition to the interdisciplinary team that developed and reviewed this proposed action, the following agencies or individuals were or would be consulted:

Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Coast Range Association
Associated Oregon Loggers
Oregon Department of Environmental Quality
Oregon Water Resources Department
Benton County Board of Commissioners
Northwest Environmental Defense Center
Oregon Natural Resources Council
State Historic Preservation Officer
Environmental Protection Agency
Confederated Tribes of Siletz Indians
Confederated Tribes of Grande Ronde
Benton Soil and Water Conservation District

Vi. INTERDISCIPLINARY TEAM MEMBERS

NAME	TITLE	DATE/INITIAL
Gary Hum bard	Forester/Logging System Specialist	5/24/01 GLH
Scott Hopkins	Wildlife Biologist	5-23-01 SH
Tom Tomczyk	Soil Scientist/Fuels Specialist	5-29-01 RT
Ron Exeter	Botanist	May 15, 2001
Mark Yeiter	Cruiser/Appraiser	May 29-2001
Tom Vanderhoof	Cultural Specialist	May 15-25-01
Bill Caldwell	Silviculturist	May 24-01
Dave Roberts	Fisheries Biologist	
Patrick Hawe	Hydrologist	PA May 15, 2001
Dick Bergen	Senior Civil Engineer Technician	RS May 24, 2001
Amy Haynes	Riparian Ecologist	AL 5/24/01
Belle Smith	NEPA Coordinator	BS 5-25-2001
Randy Gould	Natural Resource Staff Administrator (management review)	RG 05/29/2001

APPENDIX A: PROJECT MAPS

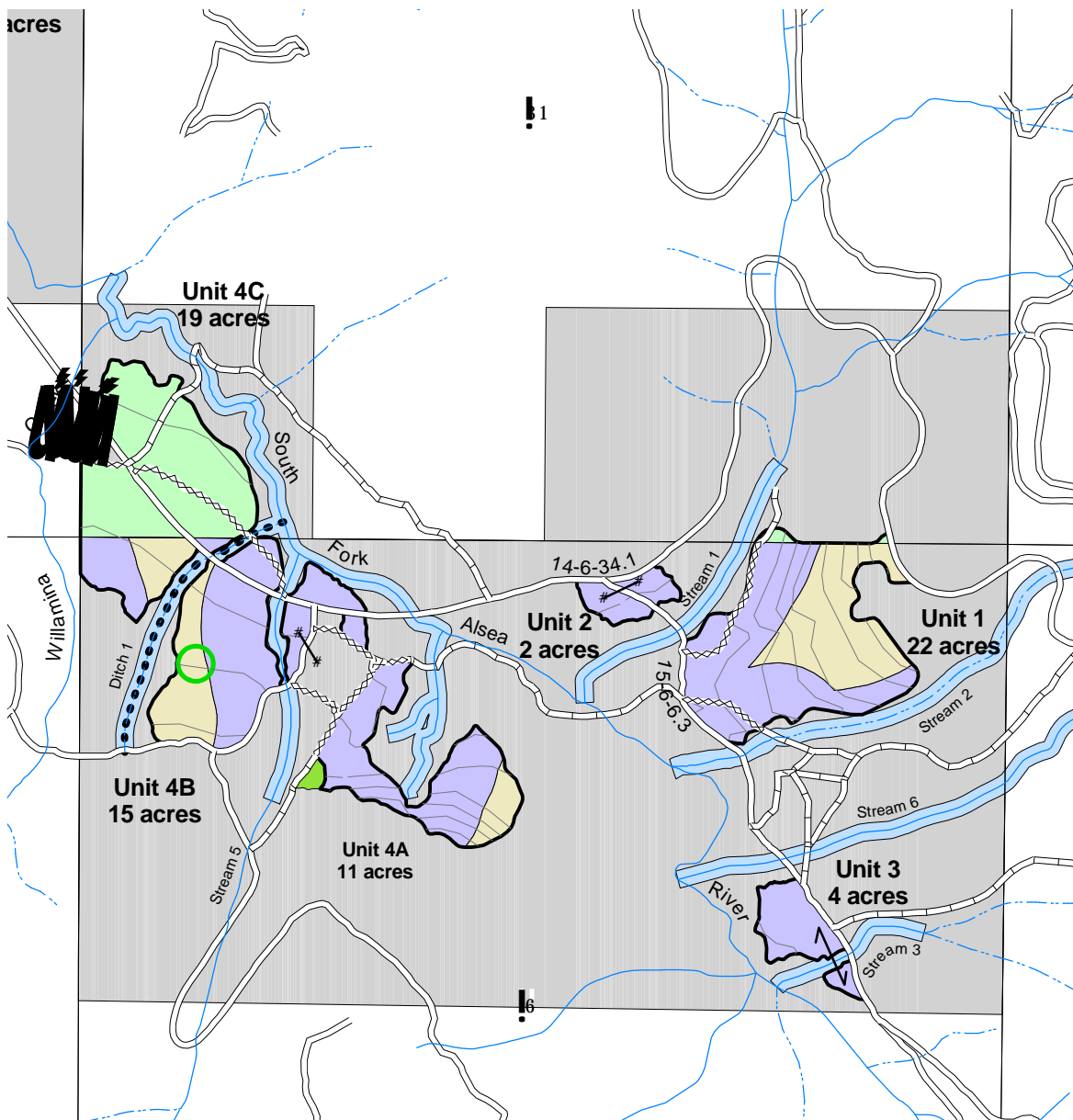
Map 1: Project Map

Map 2: Project Area Location

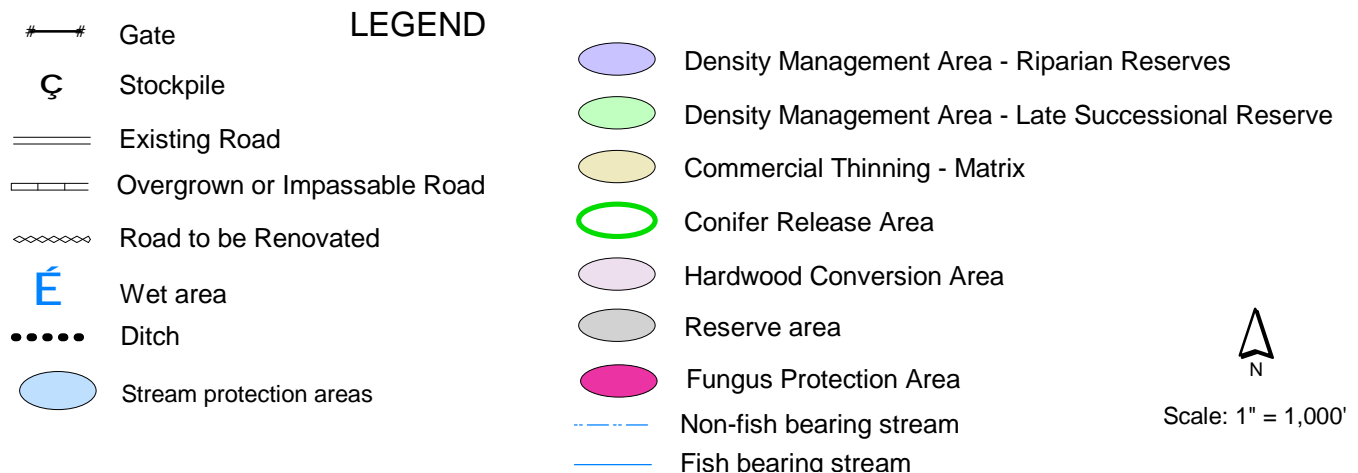
United States Department of the Interior
BUREAU OF LAND MANAGEMENT

GOTAWAY PROJECT MAP

T. 14 S., R. 6 W. Section 31 and T. 15 S., R. 6 W. Section 6, W. M.- SALEM DISTRICT - OREGON



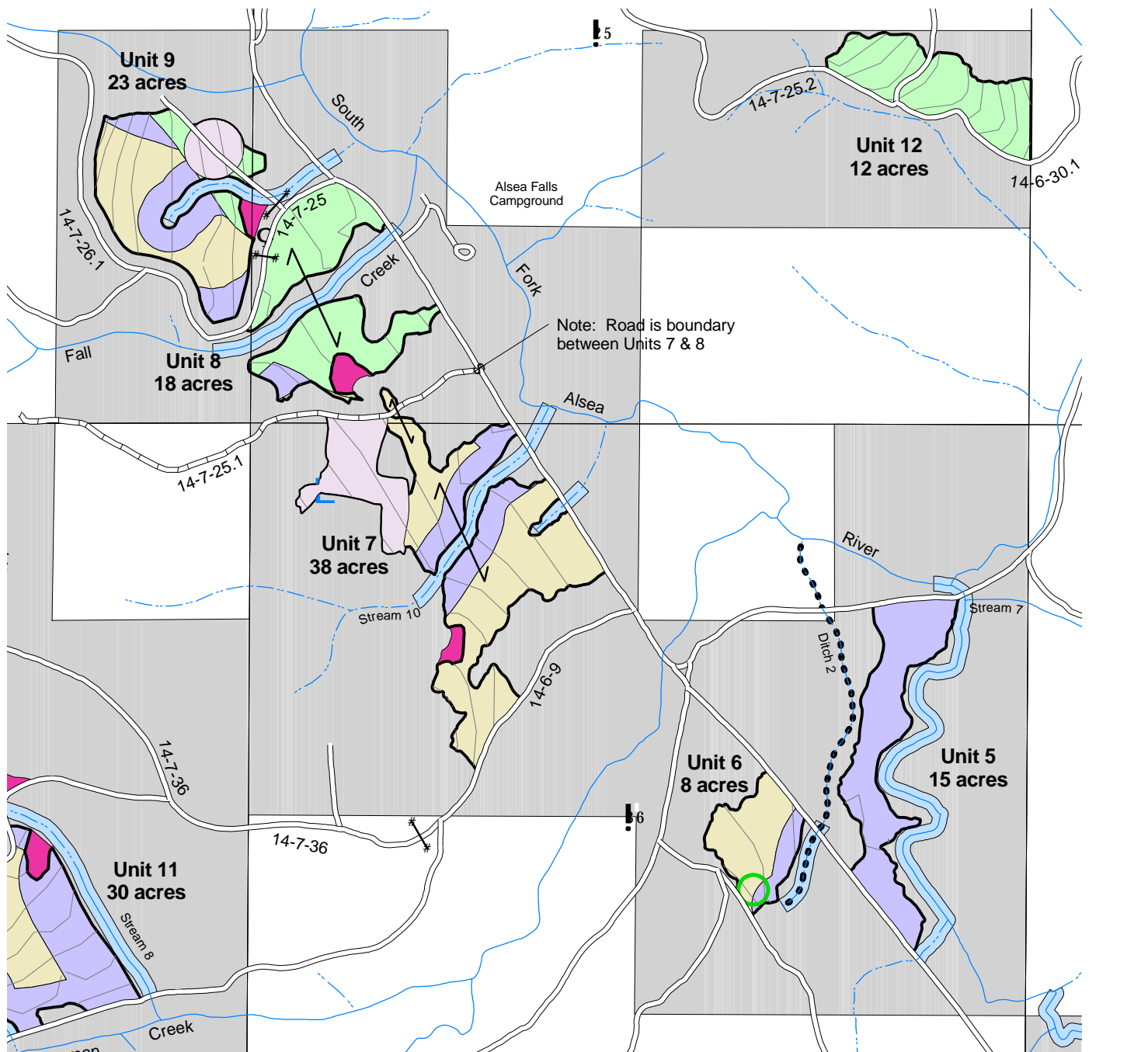
* Unit acres do not include roads or reserves.



Scale: 1" = 1,000'

GOTAWAY PROJECT MAP

T. 14 S., R. 7 W. Sections 25, 26 & 36, W. M. - SALEM DISTRICT - OREGON



* Unit acres do not include roads or reserves.

LEGEND

- | | |
|-----------------------------------|---|
| #—# Gate | Density Management Area - Riparian Reserves |
| Ç Stockpile | Density Management Area - Late Successional Reserve |
| ==== Existing Road | Commercial Thinning - Matrix |
| ==== Overgrown or Impassable Road | Conifer Release Area |
| ~~~~~ Road to be Renovated | Hardwood Conversion Area |
| Wet area | Reserve area |
| Ditch | Fungus Protection Area |
| Stream protection areas | Non-fish bearing stream |
| | Fish bearing stream |

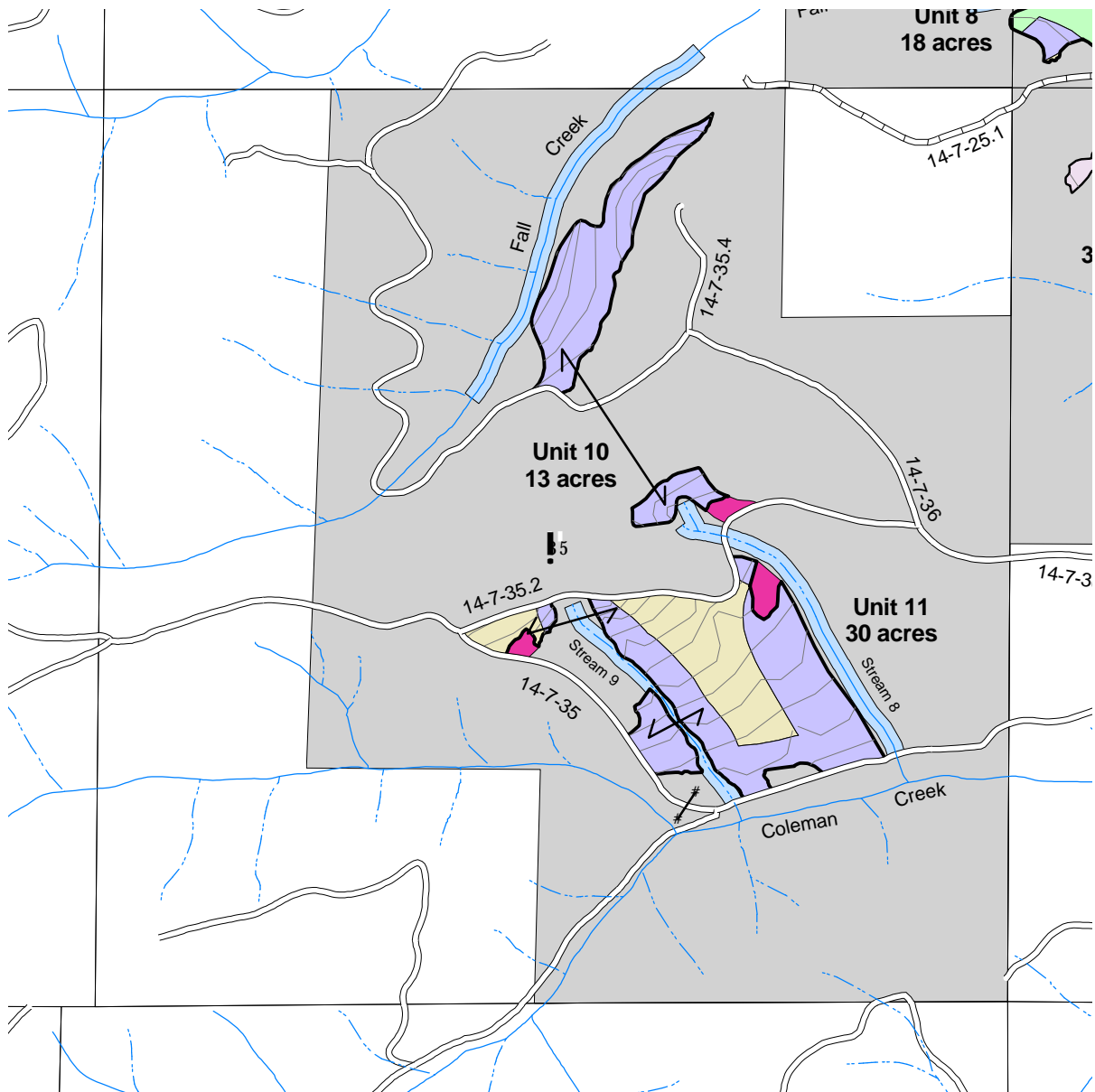
Scale: 1" = 1,000'

North arrow pointing up.

United States Department of the Interior
BUREAU OF LAND MANAGEMENT

GOTAWAY PROJECT MAP

T. 14 S., R. 7 W. Section 35, W. M. - SALEM DISTRICT - OREGON



* Unit acres do not include roads or reserves.

LEGEND

- | | |
|------------------------------|---|
| Gate | Density Management Area - Riparian Reserves |
| Stockpile | Density Management Area - Late Successional Reserve |
| Existing Road | Commercial Thinning - Matrix |
| Overgrown or Impassable Road | Conifer Release Area |
| Road to be Renovated | Hardwood Conversion Area |
| Wet area | Reserve area |
| Ditch | Fungus Protection Area |
| Stream protection areas | Non-fish bearing stream |
| | Fish bearing stream |



Scale: 1" = 1,000'

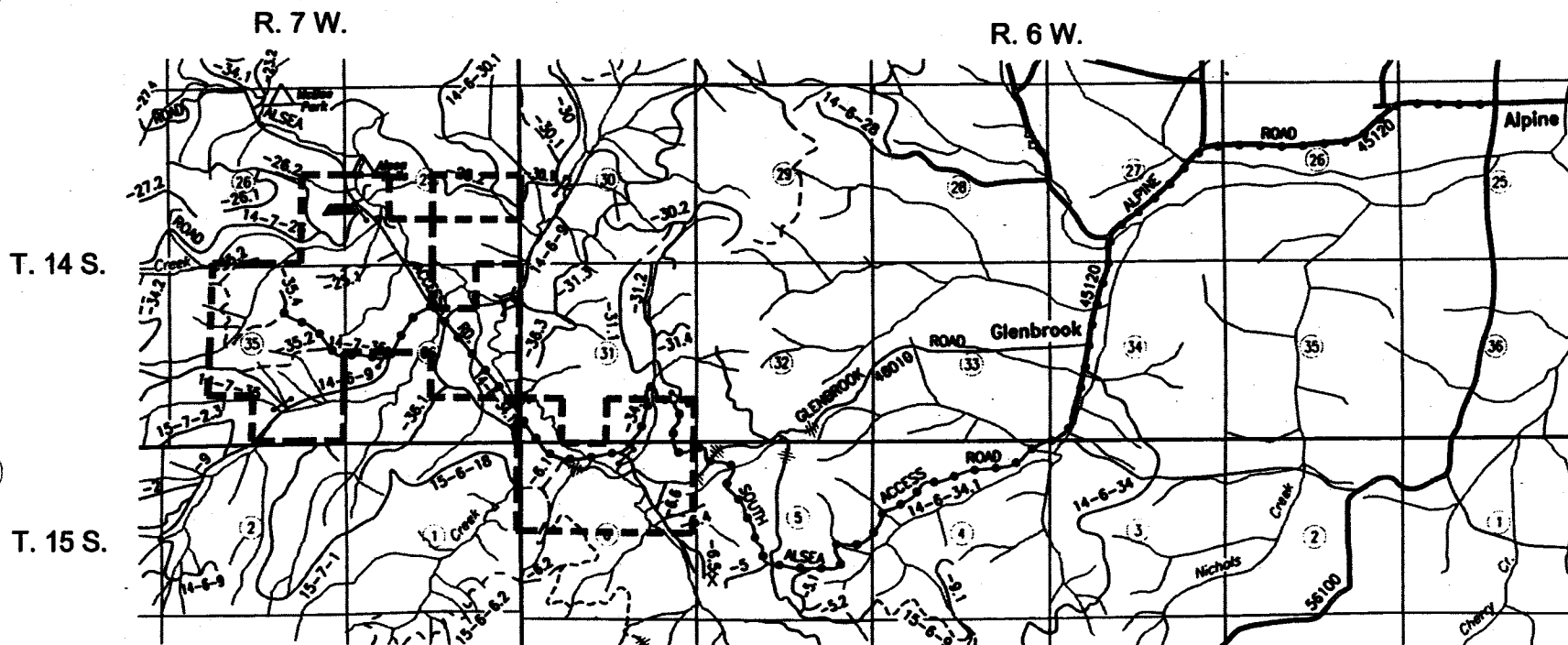
United States Department of the Interior
BUREAU OF LAND MANAGEMENT

Tract 01-301

T. 14 S., R. 7 W., Sections 25, 35, and 36, W.M. - SALEM DISTRICT - OREGON

Gotaway
Project Location Map

Scale: 1" = 1 mile



Project Location



Access Route

APPENDIX B: ENVIRONMENTAL ELEMENTS REVIEW SUMMARY

The following table summarizes environmental features which the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment).

ENVIRONMENTAL FEATURES

Environmental Feature	Affected/Not Affected/May Be Affected	Remarks
Air Quality	Not Affected	Pile burning would be accomplished in compliance with the Oregon Smoke Management Plan.
Areas of Critical Environmental Concern	Not Affected	Not in or adjacent to an ACEC.
Cultural, Historic, Paleontological	Not Affected	Post survey would be completed as stated in Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon; Appendix D.
Prime or Unique Farm Lands	Not Affected	
Flood Plains	Not Affected	
Native American Religious Concerns	Not Affected	
Threatened, Endangered, or Special Status Plant Species or Habitat	Affected	No known sites found. See Vegetation, Special Status/Attention Species, Chapter III

Environmental Feature	Affected/Not Affected/May Be Affected	Remarks
Threatened, Endangered, or Special Status Animal Species or Habitat	Wildlife: Affected Fish: Affected	USF&W consultation completed. Terms and conditions of BO # 1-7-00-F-649 incorporated into project design features. Biological Assessment submitted for consultation to the National Marine Fisheries Service (NMFS) in March 2001. Terms and conditions of Letter of Concurrence dated April 17, 2001 incorporated into project design features.
Hazardous or Solid Wastes	Not Affected	None on site nor created by proposed action.
Drinking or Ground Water Quality	Not Affected	
Wetlands or Riparian Reserves	Affected	See Aquatic Conservation Strategy (Appendix C)
Invasive, Nonnative Species	Affected	See Botany Report.
Environmental Justice	Not Affected	
Wild and Scenic Rivers	Not Affected	No Wild and Scenic Rivers in project area.
Wilderness	Not Affected	No Wilderness in project area.

COMMON ISSUES REVIEW

Resources	Affected/May Be Affected/Not Affected	Remarks
Special Attention Animal Species and Habitat	Not Affected	No S&M wildlife species found.
Special Attention Plant Species and Habitat	Affected	All sites found have been protected.
Minerals	Not Affected	

Resources	Affected/May Be Affected/Not Affected	Remarks
Land Uses	Not Affected	
Soils & Sedimentation	Affected	See Soils section.
Water: DEQ 303(d) Listed Streams Water Temperature Water Quantity	Not affected Not affected Not affected	
Rural Interface Areas	Not affected	

Appendix C to EA# OR080-00-08 GOTAWAY

Aquatic Conservation Strategy Objectives Review Summary

(Note - See RMP pg 5-6 for more detailed explanations of the ACS objectives)

ACS Objective	How Project Meets the ACS Objective
1. Maintain and restore distribution, diversity, and complexity of watershed and landscape features to ensure protection of aquatic systems.	<p>Only 10 percent of the stands in the South Fork Alsea watershed are currently classified as having an understory. Most mid-seral stands (age 30-80) are uniform evenly-spaced Douglas-fir stands (<i>RRTU</i>, p.3). Generally the watershed lacks large woody debris potential for streams (<i>SFAWA</i>, p.65) and lacks snags, down wood, sub-canopy layers and species diversity (<i>SFAWA</i>, p. 40). The proposed density management project would be a means to enhance late-successional forest conditions and speed up attainment of these conditions across the landscape. Since Riparian Reserves provide travel corridors and resources for aquatic, riparian dependant and other riparian and/or late-successional associated plants and animals, the increased structural and plant diversity would ensure protection of aquatic systems by maintaining and restoring the distribution, diversity and complexity of watershed and landscape features..</p>
2. Maintain and restore spatial connectivity within and between watersheds.	<p>Long term connectivity of terrestrial watershed features would be improved by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the project area (species diversity), increasing growth rates on remaining trees and creating fresh snags and down wood. In time, these reserves would improve in functioning as refugia for late successional, aquatic and riparian associated and dependent species. In the short term, the fresh snags and down wood created by the project would begin to mitigate the lack of snags and down wood in the watershed.</p> <p>No stream crossing culverts would be used that would potentially hinder movement of aquatic species, therefore no barriers would be created.</p> <p>Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as Riparian Reserves develop late-successional characteristics, lateral, longitudinal and drainage connectivity would be restored.</p>

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<p>3. Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.</p>	<p>Stream protection areas would maintain the integrity of shorelines, banks and bottom configurations. Criteria used to designate buffers were riparian vegetation, significant slope breaks, high water tables, and areas contributing to stream shading. (EA, p. 31 and Appendix F) All buffers are a minimum of 25 feet. Trees would be directionally felled within one tree height of the buffers and any part that falls within the buffers would not be yarded out (EA p. 9), thereby preventing disturbance to stream banks and bottom configurations.</p> <p>Channels in the project area appear to be stable and functional. In the short-term, this proposal is unlikely to alter the current condition of channels in the project area. Minimization of disturbances from the proposed project (i.e., increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat. (EA, p.33)</p> <p>Management activity throughout the project area is not likely to cause any alteration in water flows that could affect channel morphology.</p>
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<p>4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.</p>	<p>Water quality necessary to support healthy riparian, aquatic, and wetland ecosystems would be maintained. In response to the high concentration of low gradient, open channel reaches in this watershed, it is likely that ambient summer stream temperatures have always been higher relative to other coast range streams. Based on field and aerial photo observation, current stream side vegetation on tributary channels in this area is likely adequate to shade surface waters during summer base flow. These observations are corroborated by the summer stream temperature data collected in 1999-2000 (they are well within the range of natural variability for mid-coast Oregon).(EA, p. 29). Shading along all the tributaries in the project area is currently adequate, and this proposal would not substantially alter stream side shading here. Forest density and hence shading immediately adjacent to the mainstem South Fork Alsea would be left virtually unaltered under this proposal. Riparian “no-treatment” zones were specifically placed to protect portions of the mainstem channel where forest shade is critical to maintenance of the current stream temperature regime. Overall, this proposal is unlikely to have any measureable effect on stream temperatures in this watershed. The SFAWA (Map 9) indicates low stream temperature risk for the project area. Therefore, potential for increases in summer stream temperatures as a result of this action are unlikely (EA, p. 32).</p> <p>Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. Measurable effects to streamflow, channel morphology, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting it’s physical integrity, water quality, sediment regime or in-stream flows. (EA, p. 30).</p> <p>No new road construction is planned for this timber sale.</p>
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<p>5. Maintain and restore the sediment regime under which system evolved.</p>	<p>Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. Measurable effects to streamflow, channel morphology, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting it's physical integrity, water quality, sediment regime or in-stream flows. (EA, p. 30).</p> <p>For harvester/forwarder systems soil impacts in harvest roads are expected to result in light to moderate compaction in two discontinuous, narrow strips less than 3 feet in width. The trees in the project area have ample crowns, so there should be adequate slash on the ground to yard over. The affect on overall site productivity from light to moderate compaction on less than 9 percent of the total area is expected to be low (probably less than 2-3 percent reduction in yield).</p> <p>For tractor yarding soil impacts are expected to result in moderate, fairly continuous compaction within the landing areas and the main 8-10 foot wide yarding roads. Impacts would be light to moderate on less traveled portions of yarding roads. The affect on overall site productivity from mostly moderate compaction on 10 percent of the total area is expected to be less than 4 percent reduction in yield (EA, p.26).</p> <p>The risk of impacts to water quality due to road renovation would be limited by restricting work to periods of low rainfall and runoff. Renovation would employ techniques to reduce concentration of runoff and sedimentation to a minimum, such as water-bars on steeper sections of road.</p> <p>The main haul routes would be on rocked forest roads to the Alsea Access Road which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches were large enough to enter streams. However, harvest and hauling under this proposal would be limited to the dry summer months.</p> <p>No new road construction is planned for this timber sale.</p>
<p>6. Maintain and restore instream flows.</p>	<p>Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation, as a consequence of the mechanical removal of trees and reductions in stand density, has been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the upper South Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed.(EA Table 6, p. 35).</p>

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<p>7. Maintain and restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.</p>	<p>The proposed thinning would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects or only negligible short-term negative effects on existing flow patterns and stream channel conditions.</p> <p>Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation, as a consequence of the mechanical removal of trees and reductions in stand density, has been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the upper South Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed.(EA Table 6, p. 35).</p> <p>The minimization of potential disturbances from the proposed project is likely to result in the maintenance of stream channels in their current condition. Some channels in the project area are currently functioning at the low end of the range expected under “reference conditions.” Other channels are functioning normally. In the short term, this proposal is unlikely to alter the current condition of channels in the project area for several reasons; 1) there would be no activities directly in channels, or on streambanks or floodplains; 2) streamflows and sediment delivery are unlikely to be altered; and 3) the stream’s supply of large wood would not be altered.</p> <p>Over the long term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western red cedar, which are currently suppressed. In the upper South Fork Alsea River large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat (EA p. 33).</p>
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<p>8. Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide thermal regulation, nutrient filtering, and appropriate rates of bank erosion, channel migration and CWD accumulations.</p>	<p>The actual riparian zone (as defined by criteria in EA p. 31 and Appendix F) along streams would be excluded from treatment, by designating stream protection buffers, and only the upslope portions of the Riparian Reserves would be included in the density management treatment.</p> <p>All trees would be directionally felled away from streams within one tree height of stream protection buffers and if a cut tree does fall within a stream protection buffer, that part of the tree would remain (EA p. 9). Stream buffers and residual trees would continue shading streams.</p> <p>Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of down wood, and species diversity) are generally lacking in the young stands surrounding and including the project area (EA p. 41) Aside from protecting actual riparian vegetation, the proposed project would increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid canopy and ground levels. It is expected that understory initiation of shade tolerant conifers associated with canopy layering would be promoted in areas of increased light over the long term. In the short term a more complex understory would develop, consisting of more shrub species. (EA p. 36)</p>
<p>9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species</p>	<p>Habitat to support well distributed riparian-dependent and riparian associated species would be restored by reducing overstocked stands, moderating tree species diversity, altering forest structural characteristics and amending coarse woody debris conditions.</p> <p>Thinning within the riparian area would enhance stand conditions, growing trees faster than if the stand were left untreated. This would increase the potential for future high quality instream large woody debris. (EA p. 46).</p> <p>Species linked to Riparian Reserves issues are mostly associated with late-seral forest conditions, which would be enhanced within this stand with negligible affects to existing function of the local Riparian Reserves corridors. The resulting forest structure and CWD creation is likely to improve overall quality of habitat for many species in the immediate future.</p> <p>Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver 9 (EA p.35)</p>

Appendix D to EA# OR080-00-08 GOTAWAY

BENEFICIAL USES REVIEW SUMMARY		
Downstream Beneficial Uses (Salem FEIS 3-9)	Designated Use (Y/N)?	Remarks /References
Public Water Supply	N	WRIS
Domestic Water Supply	N	WRIS
Irrigation	Y	See EA p.30
Fisheries	Y	See EA p.30
Wildlife	Y	See specialist report.
Recreation	Y	See EA p.30
Maintenance of esthetic Quality	Y	See EA p.30
OTHER WATER ISSUES		
Issue/Concern	Listed (Y/N)	Remarks /References
DEQ 303d listed stream	N	
Key Watershed	N	

APPENDIX E: GUIDELINES TO REDUCE BARK BEETLE MORTALITY

The following guidelines (from Hostetler, B. and D. Ross. 1996. *Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Beetle*. Westside Forest Insect and Disease Technical Center. Unpublished.) should be followed to reduce the probability of Douglas-fir bark beetle (DFB)-caused mortality in residual standing trees in westside forests where live Douglas-fir are being cut for CWD.

- **Fell and leave the minimum number of trees possible that would allow achievement of CWD objectives.** Remember, the rule-of thumb is that the number of standing trees killed would be about 60 percent of the number that are felled.
- **Fell the trees no earlier than July and no later than the end of September – the later they can be felled during this period, the better.** This would help insure that the trees are felled after the primary flight of DFB and that some drying of logs would occur so that the logs would be less suitable as host material the following spring.
- **Staggering the years in which trees are being felled may be beneficial if large numbers of trees are being felled and if enough time is left between felling.** The time period between tree falling should be at least three years; four would be better. Otherwise, the situation may be exacerbated by allowing beetles to build to even higher population levels.
- **Monitor what is happening in these stands regarding infestation of down logs and infestation and killing of standing live Douglas-firs.** To date, no data have been collected from areas where silvicultural practices such as this have been used, and any information gathered would be useful under the principles of adaptive management.
- **If DFB populations are at high levels in the general area because of large amounts of recent blowdown, it would be prudent to postpone felling of CWD trees until populations subsided.** This would be two years from the summer in which many discolored trees are present (or four years after the first spring following the blowdown), unless there are large amounts of blowdown in subsequent years. If this is the case, one should wait longer. Once the infested trees discolor, the extent and intensity of the previous year's DFB activity can be estimated using the Annual Aerial Insect Detection Survey maps.
- **If possible, fell tree species other than Douglas-fir for CWD.**

APPENDIX F: CRITERIA FOR IDENTIFYING STREAM PROTECTION AREAS

1) A 25 foot minimum buffer would be flagged to exclude the following areas based on field identified features (whichever is greatest). Activities may occur in this area, but material would not be removed and heavy machinery or equipment would not be allowed.

- a. Slope break- point below which the slope is actively eroding and contributing sediment to the stream.
- b. Floodplain- flat, accessed by the stream once in a blue moon.
- c. Stream banks- feature which contains the “active” stream channel.
- d. High water tables- flat, mushy soils, skunk cabbage, standing water, etc..
- e. Flood prone- 2 x max depth @ bankfull (for streams with none of the above).

2) “Minimum” would be modified based on associated issues or field identified risks. Examples include-

- a. Perennial streams at risk for temperature increases due to the action (i.e., southern aspect, low topographic relief, vegetation provides significant shading). We can either extend the minimum to 100 feet at these sites or apply a model to get more precision in our estimate.
- b. Unstable slopes- this is open to discussion. We may want to thin along debris torrent prone headwater channels even though they are potentially “unstable” because these areas are significant LWD source areas. However, actively eroding sites adjacent to streams with ravel on the surface and “jack-strawed” trees may be excluded.
- c. “Sensitive” streams- sand bed channels or channels with high residual impacts (bank erosion, incision, heavy fine sediment load, etc) may warrant extra protection.